The Educational Effects Of Word Processors

County of Lacombe No. 14

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Prepared under contract to
ALBERTA EDUCATION
December, 1986

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ABSTRACT

The objective of this study is to determine if significant differences in student learning and student attitudes occur as a result of the use of word processors. Treatment and control groups were drawn from students attending grades four through nine in schools within the County of Lacombe. The treatment group used word processors for Language Arts written assignments, while the control group was denied access to word processing. Study duration was from November, 1985, to June, 1986. In addition to the main focus, questions dealing with curriculum changes, teacher inservice requirements, obstacles to incorporating word processing into Language Arts programs, effective teaching strategies, and effective school board policies are also discussed.

Objective measure using the Canadian Tests of Basic Skills show some indication of improved basic skills with the most significant results occurring in grade six. It is felt that dramatic improvement was unlikely due to the following factors:

Treatment group students had to learn how to operate a word processor in addition to their regular Language Arts curriculum. No additional Language Arts time was provided for this additional content.

Lack of keyboarding skills hampered text entry for most students.

Time and practice are needed to feel comfortable using a word processor. Treatment group students were concentrating on learning the word processor for the bulk of the study duration, allowing little time to concentrate on writing.

It was not until the late stages of the study that the treatment students demonstrated a greater willingness to edit than the control group students. This meant that there was little time left to practice revision before posttesting was completed.

When a greater willingness to edit, on the part of the treatment group students, became evident, these students were hampered by limited access to the equipment.

Objective measure using the School Subject Attitude Scales indicate improved student attitudes, with the most significant improvements occurring in grade eight.

Subjective measures strongly support the incorporation of word processing in Language Arts. Enthusiasm for using the word processor was prevalent in all treatment classes and treatment class teachers.

The learning and application of new word processing skills had no detrimental effect on treatment group students, in spite of the time taken from the regular curriculum to master these new skills. It is felt that increased access, and a longer duration between testing would have yielded a more significant improvement in language skills. Further research should be undertaken to determine the educational effects of word processors, and objective measurement of student writing ability should be considered in addition to basic skill measurement. This research should minimize the effects of lack of keyboarding skills and limited access to equipment. Duration of treatment should be sufficiently long enough to minimize the effect of the time taken to master the word processor.

ACKNOWLEDGEMENTS

The principal investigator would like to thank the members of the steering committee and the following people for their contributions:

For acting as treatment group cooperating teachers:

* Mrs. Maureen MacAskill, Grade Four teacher at James S. McMormick Elementary School in Lacombe, Alberta.

* Mr. Arnie MacAskill, Grade Five teacher at Bentley Elementary School in Bentley, Alberta.

* Mrs. Margaret McLaughlin, Grade Six teacher at James S. McCormick Elementary School in Lacombe, Alberta.

* Mrs. Rose Fenske, Grade Seven teacher at Lacombe Junior High School in Lacombe, Alberta.

* Mr. Ron Kenworthy, Grade Eight teacher at Lacombe Junior High School in Lacombe, Alberta.

* Mr. Joseph Foley, Grade Nine teacher at Lacombe Junior High School in Lacombe, Alberta.

For acting as control group cooperating teachers:

* Mrs Jane Flewelling, Grade Four teacher at James S. McMormick Elementary School in Lacombe, Alberta.

* Mrs. Margaret Jones, Grade Five teacher at James S. McMormick Elementary School in Lacombe, Alberta.

* Mr. Ron Barnhart, Grade Six teacher at James S. McCormick Elementary School in Lacombe, Alberta.

* Mrs. Rose Fenske, Grade Seven teacher at Lacombe Junior High School in Lacombe, Alberta.

* Mr. Ron Kenworthy, Grade Eight teacher at Lacombe Junior High School in Lacombe, Alberta.

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CHAPTER ONE

INTRODUCTION AND REVIEW OF RELEVANT LITERATURE

As the title suggests, this study addresses the educational effects of word processing. Word processing is enjoying increased acceptance in the classroom, and is a good example of how educational computing has come of age. The detailed aspects of how a computer operates, and the necessity of learning those details is becoming irrelevant, and the true power of the microcomputer is becoming more apparent.

A. Introduction

At the dawn of the educational computing age, for some of us at least, there was the Digital PDP8, a curious array of toggle switches attached to a teletype machine. Within hours of commencing our task of performing the calculation of the mean of ten numbers, or some other such trivial task, we had managed to have the machine do a calculation for us. A very easy task without the machine had become long and time consuming with the assistance of the PDP8. One had to stop and evaluate what had occurred.

On the one hand, the machine had overly complicated a simple task. On the other, there was the realization that the increase in difficulty in getting the machine to perform more difficult tasks was not nearly proportional to the increase in difficulty of the task itself. One must then conclude:

> If the task is sufficiently difficult as to be more difficult to perform manually than to perform with the help of the machine, then the machine is in fact a valuable ally.

A conclusion that probably predates the wheel, this seemingly simple statement caused many of us to relegate the computer to the status of academic curiosity. We concluded that the difficulty level in accessing and using the machine is always sufficiently high as to make the task more easily performed without the machine. Many came to this initial conclusion in the early days of educational computing. Many are still coming to that same conclusion.

The number of types of tasks that can be accomplished with less difficulty using the computer is increasing, due mainly to increased access to the machines, and decreased difficulty in using the machines. There are four identifiable key issues: acceptance, access, keyboarding and educational effects, that influence the adoption of word processing in school classrooms.

B. Review of the Literature

1. Acceptance

The first issue deals with acceptance. The pace at which computers are becoming easier to operate is staggering. We are not dealing with an entirely new generation of teachers, or students for that matter, as many members of the educational community are standing by the initial conclusion that the computer is too difficult to use to be of any practical value. These are the people that need to be made to realize that the computer is easier to operate today than it was yesterday. "To suggest that computer literacy be denied our children is elitism in the extreme." (Thornburg, 1982). The denial comes if we do not reverse the initial conclusion made by some teachers and some students. Many of the teachers that dabbled with computers in the early eighties should have another look. Few application programs were available then, thus many 'cutting edge' teachers tried to share the joys of programming with unappreciative audiences. One of the first rules of successful teaching is to 'Know Your Audience'. Programming is a specialized skill that has its place. That place however, would not appear to be in the Language Arts classroom.

The problem is perhaps best summed up by the term 'Computer Literacy'. Although it is difficult to pinpoint the meaning of this term, one author would suggest that to be computer literate, one must possess "Knowledge of what computers can and cannot do, knowledge of applications, knowledge of abuses, plus an awareness of their impact on society" (Marshall, 1982). Perhaps there is too much emphasis on Marshall's definition of 'computer literacy', emphasis that makes the technology suspect and teachers wary. The computer should be treated as one might treat any other machine. Does it make the task easier, or better completed? If so then it should be employed. Does one have to be 'computer literate' to employ a word processor? Does skill in word processing constitute 'computer literacy'? If those that have concluded that it is too difficult, and of little practical value to become 'computer literate' can be shown tasks that are more easily and better completed with the help of the computer, perhaps they will reevaluate. Should the computer not be treated as a means to an end, rather than an end?

Word processing is perhaps, the best example of the use of computer technology as a means to an end, that end being writing. Everyone should possess good language skills. We live in a society dependent upon information, much of it written. If the word processor proves to be a valuable tool in teaching language skills, then it should be embraced. Even if the only benefit should prove to be easing the task, rather than improving the product, word processing should still be embraced. Think of how much easier it became to write in pen and ink with the introduction of the ball point pen. 'Computer literacy' to some extent would be a byproduct of the use of word processing. The necessary level of 'computer literacy' achieved would be equal only to that required to accomplish the initial end, that is, to write.

This is in fact, integration of computer technology into existing curriculum. There are many other examples of integration of technology to achieve an end, rather than introduction of technology for its own sake. Few primary teachers would view student knowledge of all that can or cannot be done with paper as a necessary prerequisite to asking their students to take pencil in hand. It is doubtful that the societal impact of Gutenburg is discussed before students are allowed to read. This is not to negate the importance of Marshall's 'computer literacy', but let us not allow a lack of 'computer literacy' prevent us from exploiting the computers real value; that is to make tasks easier and better completed. Acceptance of the computer as simply a device that can and should be used to better meet an end is a key issue.

2. Access

The second issue is access. "Writing takes a lot of time-concentrated, personal time for each writer. Before a computer can have a serious impact on someone's ability to write, he or she must have ready access to it as a familiar tool." (Watt, 1984) Those of us that use a word processor for all but the smallest memo tend to take for granted the fact that we have ready access to our machines. For a frequent user, writing without the word processor is an onerous task. We know the value of word processing because we use it all the time.

Before teachers are likely to adopt word processing, teachers will require ready access to microcomputers. "We're the only institution that provides tools for its clients rather than its workers." (Rhodes, 1986) If we expect our students to benefit, ready access must be provided for them as well. Watt goes on to suggest that "Word processing won't make much difference in schools until computers are almost as common as pencils." (Watt, 1984). Although this comment overly exaggerates the point, the point is well taken. Fay Wheeler states "you have to plan for adequate access to the computer. Students need time and guidance to become as efficient at using a word processor as they are at using a pencil" (Wheeler, 1985) The point is in fact efficiency. Use of the word processor must be often enough to make word processing skills as routine as pencil skills, otherwise the efficiency will not be there.

3. Keyboarding

The third issue is that of keyboarding. The question of keyboarding cannot be ignored. The correlation between quality and quantity of writing is generally accepted. The ease of revision with a word processor can be easily outweighed by the difficulty of text entry. In a control group study of intermediate grade students, the treatment (word processing) group was subdivided into slow and fast typists. The author found "no differences in the writing quality of the group using computers in process writing and the group afforded traditional instruction. However, the writing quality of the fast typists was significantly better than that of the slow typists" (Wetzel, December, 1985). Although the advantage of word processing is not obvious here, it does point out the effect of text entry speed. The issue is further complicated by the matter of formal keyboarding skills as opposed to self developed skills. Observation of students with considerable computer experience, but no formal keyboarding training, shows that touch typing is not the only way to accomplish relatively quick text entry. Typing teachers tell us however, that the use of informal, or self developed technique, creates habits that are difficult to break if one tries to cross over to formal touch typing technique. It is therefore important that formal keyboarding be introduced into the curriculum along with word processing. In an article in The Computing Teacher Keith Wetzel states "Based on a review of the research, most students in grades three through five will average 10 gwpm (gross words per minute) after receiving teacher instruction and practice on a microcomputer typing tutorial for 35 minutes per day for four weeks. If this schedule is extended to nine weeks, the average student will type 15 to 20 gwpm." (Wetzel, June, 1985). Although this is not a small amount of time, the issue of proper keyboarding technique is critical enough to warrant a significant status within the curriculum.

4. Educational Effects

The fourth, and perhaps most critical issue is the question: Does word processing actually contribute to better language skill development? Skilled writers draft several times, including revisions in structure, concept, words and sentences (Nold, 1981). Students, on the other hand, tend to try to make the first draft "right" (Shaughnessy, 1977), often viewing revision as punishment (Schwartz, 1982). Word processing can steer student writing toward the experienced writer's paradigm. In a study of ten intermediate grade students, the revision habits of these students were observed to incorporate "more revisions within the body of the existing text, as opposed to adding onto the end of a composition" and "the children's revisions became more content oriented and less focused on mechanical corrections without an increase in mechanical errors." The children "began to view the writing they produced within the electronic environment as more susceptible to revision" (Boone, 1985). If one accepts revision as the major component of the writing process, it follows that perception of susceptibility to revision is likely to encourage more revision, and result in a better finished product. This ease of revision may in fact lead one to view a written work as the current version, rather than the finished product. Students may perceive revision as a desirable step rather than a punishment.

The rapid improvement in software will continue to ease more of the writer's tasks. WordPerfect, for example, a sophisticated word processing package being adopted in Alberta high schools, goes beyond the traditional functions of word processors by including direct access to a spelling checker and a thesaurus. Automation of these writer's tools has great potential to improve the quality of writing.

C. Scope, Research Questions, and Major Objective

The study was originally conceived in the summer of 1985. Scope was originally to encompass Language Arts and Social Studies in divisions II and III. It soon became apparent that it would be impractical to attempt inclusion of Social Studies due to limited computer access. Duration was from November, 1985 to June, 1986. The study addresses the following six research questions:

1. What changes, if any, need to be made to Language Arts courses in divisions II and III to incorporate and encourage the use of computer word processing by students and educational staff?

2. What are the types of teacher inservice that must occur before word processing can be successfully incorporated into classrooms?

3. What obstacles face schools and teachers wishing to incorporate computers, particularly word processing, into teaching repertoires?

4. What teaching strategies encourage the use of word processors by students in elementary and secondary programs?

5. How does the integration of word processors into Language Arts affect student learning, behaviors, and attitudes?

6. What are the salient features of effective school board policies regarding computer usage, particularly word processing, in schools?

Question five is the main focus of the study, and deals with the educational effects of having students in grades four through nine use word processing for the major portion of their Language Arts Writing. The objective of this component is to determine if significant differences in student learning and student attitudes occur as a result of the use of word processors. The remaining five questions are subsidiary in nature; the answers to them being, for the most part, gleaned from the experiences encountered in answering question five. A discussion of how each question was dealt with is included in Chapter Two.

CHAPTER TWO

METHODOLOGY

A. The Sample

Two classes participated from each of grades four through nine, one acting as the treatment group, the other acting as the control group. Selection was accomplished by first asking for teacher volunteers to participate in the project. From the group of junior high teachers, teachers that taught Language Arts to more than one class at a particular grade level were selected. From the group of elementary teachers, although not originally intended, selection of treatment classes was based on availability of sufficient computer lab time within the lab schedule. All junior high school classes were from Lacombe Junior High School, Lacombe Alberta. All elementary classes were from James S. McCormick Elementary School, Lacombe, Alberta with the exception of the grade five treatment class, which was from Bentley School, Bentley, Alberta.

B. Treatment Group Computer Access Time

Computer laboratory access time ranged from eighty to ninety minutes per week. From November until January the student to computer ratio was 2:1. From February to June the student to computer ratio was reduced to 1:1. It is reasonable to assume that students had 40 to 45 minutes per week at the computer from November through January, and 80 to 90 minutes per week at the computer from February through June. In addition to lab access, the grades 4, 5, and 6 classes had some additional access to a single computer during the interval between lab periods. Table 1, Treatment Group Access Time, lists treatment group computer lab access time.

C. Measuring Instruments

1. The Canadian Tests of Basic Skills are published by Thomas Nelson (Canada) limited. Grade equivalents were used for grades four through eight to measure the progress of students involved in the study. Form 6, 1981 was used to test students in these grades in the following:

-Vocabulary

-Reading Comprehension

-Language Skills
    -Spelling
    -Capitalization
    -Punctuation
    -Usage

Percentile ranks were used for grade nine students and form 5, 1981 was used to test these students in the following:

-Reading Comprehension

-Written Expression

The Canadian Tests of Basic Skills were administered as a pretest and a posttest.

2. School Subjects Attitude Scales are published by Alberta Education and were developed by V. R. Nyberg and S. C. T. Clarke, of the University of Alberta, in 1983. The scales consist of twenty-four descriptive, bipolar word pairs, separated by five response positions: very much, a bit, neither, a bit, very much. A score of five is assigned to each 'very much' response to a positive descriptor, a score of one to each response of 'very much' to a negative descriptor. The other responses range from two to four respective to the position of the response between the negative descriptor and the positive descriptor. The first eight word pairs define the evaluation factor, the middle eight pairs the usefulness factor, and the last eight pairs the difficulty factor. Scales were completed by all students for the following subjects:

-Language Arts, Reading (Literature)
    -evaluation
    -usefulness
    -difficulty

-Language Arts, Language (Composition)
    -evaluation
    -usefulness
    -difficulty

- Language Arts, Spelling
    - evaluation
    - usefulness
    - difficulty

As with the Canadian Tests of Basic Skills, the School Subjects Attitude Scales were administered as a pretest and a posttest.

D. Research Design

The study addresses six research questions. Question five is the matter of greatest interest to educators, and is the focus of this study. The remaining five questions are subsidiary in nature, with answers to these questions being in the most part, gleaned from the experiences encountered in researching question five. The Questions were dealt with as follows:

1. What changes, if any, need to be made to Language Arts courses in divisions II and III to incorporate and encourage the use of computer word processing by students and educational staff?

This question was addressed through consultation with the treatment group teachers. It was felt that the front line experiences of teachers attempting a major introduction of word processing would best answer the question of curricular change. The issue was addressed in the focused interviews.

2. What are the types of teacher inservice that must occur before word processing can be successfully incorporated into classrooms?

A record of inservice offered to treatment group teachers was kept. During the focused interviews, as well as being asked about 'must occur' content, teachers were asked to describe ways in which the inservice could be improved to ease the introduction of word processing.

3. What obstacles face schools and teachers wishing to incorporate computers, particularly word processing, into teaching repertoires?

This question is historical in nature, in that all problems encountered or perceived are reported.

4. What teaching strategies encourage the use of word processors by students in elementary and secondary programs?

Teachers were asked to describe the kinds of teaching strategies that did and did not work well for them. As well, teachers were asked to describe different approaches that they were likely to try in the future.

5. How does the integration of word processors into Language Arts affect student learning, behaviors, and attitudes?

As mentioned above, this is the major component of the study. The objective of this component is to determine if significant differences in student learning and student attitudes occur as a result of the use of word processors. The Canadian Tests of Basic Skills was used as the measure of student learning, while the School Subjects Attitude Scales test was used a measure of student attitudes. The Nonequivalent Pretest-Posttest Control Group Design was used in evaluating student learning and student attitudes. Every attempt was made to make the testing as unobtrusive as possible, therefore recent Canadian Tests of Basic Skills results were used wherever possible. Students with incomplete results were omitted from the sample. Table 2, Testing Schedule, indicates the timing of all testing.

In addition to the testing, biweekly and concluding focused interviews with treatment group teachers were used for subjective measure.

Statistical Procedure

1. Canadian Tests of Basic Skills

Mean scores and standard deviations were calculated for both pretest and posttest applications of each Canadian Tests of Basic Skills sub-test, as well as for all sub-tests combined, at each grade level. Single tailed t-tests were performed on treatment and control group pretest means to establish whether or not significant differences occurred before the treatment was applied. Single tailed t-tests were then performed on treatment and control group posttest means to establish whether or not significant differences occurred after the treatment was applied. The .05 level of significance was chosen to indicate significant differences.

Single tailed t-tests were also performed on the gain in C.T.B.S. means. Tables 4, 6, 8, 10, 12, and 14 contain this information. The reader is cautioned against attaching strong significance to this information, as a major problem with gain scores is that they are unreliable. "The higher the correlation between pretest and posttest scores, the lower the reliability of the change score. Also, the reliability of the change score is affected by the degree of unreliability of the pretest and posttest themselves." (Borg, Gall, 1983) An example of the questionable reliability of gain scores occurs in the Grade 8 Reading sub-test. The correlation between pretest and posttest means is high, and the resulting t-tests show significant differences between the treatment group and control group mean gain scores. This result contrasts with the results of tests performed on the Reading pretest and Reading posttest. The author concluded that there were no significant differences, however, other conclusions are plausible. The information contained in these tables is included for those that may find it useful, and for the sake of completeness.

The reader may have noted an apparent error in arithmetic. If the one were to subtract the pretest mean scores from the posttest mean scores using Table 11, Grade 8 C.T.B.S. Results, the result would indicate a mean gain of -0.1 for the control group on the reading sub-test. Table 12, Grade 8 C.T.B.S. Mean Gain, indicates a gain of -0.0. This apparent error is due to rounding. The actual control group pretest mean score is 8.6869565 (8.7 rounded), while the posttest mean score is 8.6391304 (8.6 rounded), resulting in a difference of 0.0478261, which rounds to 0.0.

2. School Subjects Attitude Scales

Pretest and posttest means and standard deviations, were calculated for the following at each grade level:

-Reading evaluation questions
-Reading usefulness questions
-Reading difficulty questions
-all Reading questions

-Language evaluation questions
-Language usefulness questions
-Language difficulty questions
-all Language questions

-Spelling evaluation questions
-Spelling usefulness questions
-Spelling difficulty questions
-all Spelling questions

-all subjects evaluation questions
-all subjects usefulness questions
-all subjects difficulty questions
-all subjects, all questions

Single tailed t-tests were performed on treatment and control group pretest means to establish whether or not significant differences occurred before the treatment was applied. Single tailed t-tests were then performed on treatment and control group posttest means to establish whether or not significant differences occurred after the treatment was applied. The .05 level of significance was chosen to indicate significant differences.

6. What are the salient features of effective school board policies regarding computer usage, particularly word processing, in schools?

This question addresses funding, staffing, capital expenditures, student:computer ratios, facilities, and related topics.

Findings are dealt with on a question by question basis in Chapter Three.

CHAPTER THREE

FINDINGS

As stated in Chapter One, the focus of this study is on research question five, and the objective: to determine if significant differences in student learning and student attitudes occur as a result of the use of word processors. This question, and the five other questions, have a subjective component. The subjective findings for each question will be dealt with first, followed by the objective findings as they relate to question five.

A. Subjective Measures

1. **What changes, if any, need to be made to Language Arts courses in divisions II and III to incorporate and encourage the use of computer word processing by students and educational staff?**

There was general agreement on the part of the elementary teachers with respect to this question. All felt that Word Processing was a valuable activity, and that keyboarding was an integral component. Keyboarding should become a part of the Language Arts curriculum, enjoying a similar status to that of handwriting or penmanship. Word processing should assume the status of a tool used to teach writing and the writing process. Word processing and keyboarding need to be initially taught as mechanical skills. As the child progresses, the mechanics are de-emphasized, and word processing is taught as a creative skill, integral with the writing process. All elementary teachers felt that 120 minutes per week of computer lab access time would be optimum.

The Division III teachers had a similar goal, but they approached it differently, due mainly to the lack of word processing in the history of the group they deal with. Suggestions included a separate block of time outside of Language Arts to teach the mechanical skills, then using the word processor as a tool to teach writing within the existing curriculum. Also suggested was making word processing a recommended skill or concept, with specific guidelines as to how to include a unit on writing with a word processor. Once the junior high population changes to one with word processing experience, word processing would be integral with the junior high Language Arts Curriculum. Ideally a computer lab would be available, but not necessarily used, for every Language Arts period.

All teachers felt that keyboarding and word processing should be introduced in the elementary grades, with suggestions ranging from grade 4 to as soon as the students are physically able. It was felt by all teachers with the exception of one, that word processing is a skill that all students should possess. The excepted teacher felt that this is not presently true, but may become true in the future. It was also mentioned that failure to master touch typing should not preclude instruction in word processing.

2. What are the types of teacher inservice that must occur before word processing can be successfully incorporated into classrooms?

All teachers felt the inservice provided was well done and necessary (see Appendix A). Emphasizing the need for teachers to practice between and after inservice sessions would not appear to be enough for all teachers. One teacher felt some guilt over practicing very little and not being ready for the students. Too many mechanical errors that would have been prevented with practice got the whole project off to a bad start for this teacher. Another teacher said confidence came after writing a six page essay using MECC Writer before introducing word processing concepts to the students. Suggested improvements to the inservice provided included scheduled practice sessions with the inservice instructor present. These sessions would include sample lessons that the teachers would work through in a similar fashion to the students.

3. What obstacles face schools and teachers wishing to incorporate computers, particularly word processing, into teaching repertoires?

A number of obstacles were mentioned by treatment group teachers including access, necessity for inservice, lack of keyboarding skills, mechanical operation of the word processor, technical problems, curriculum time constraints, teacher attitude, and personal use of word processing by the teacher.

Access would appear to be the major problem facing teachers wanting to incorporate word processing. All teachers felt access to a computer lab that provided one machine per student was necessary, and a computer in the home classroom was desirable. In the early stages of the study, until the end of January, there was only one computer for every two students. This proved to be a very unsatisfactory arrangement, with a lot of wasted student time, and a lot of teacher frustration. This problem was solved in late January, when new computers were purchased to bring the student to computer ratio down to 1:1. Treatment group teachers were given priority access to computer facilities, access that could not be made available to all, or even most teachers within the schools participating in the study. There simply is not enough facility time available. In order to obtain the desired facility time for treatment groups, a weekly schedule was used, with a certain time during the week scheduled for each class. This arrangement was palatable to the elementary teachers, but all junior high teachers said in retrospect, that they would have preferred a daily block of time during the early part of the year to concentrate on writing with a word processor, followed by frequent, but irregular access during the remaining portion of the year.

Inservice of teachers was felt to be a necessity as mentioned earlier. Treatment group teachers did not feel that they would have been willing or able to go it alone in implementing a unit on word processing, and that this would be a major obstacle facing other teachers wanting to incorporate word processing. Timing of the inservice was felt to be important as well. Inservice sessions tend to be short in duration, and intense in content. Delivery of inservice should occur shortly before implementation in the classroom. Experience has shown that a lapse of too much time without practice will result in skill loss. Two of the treatment group teachers do not now use word processing as a teacher utility skill in spite of their study experiences. One cited access as a problem, stating that if a computer were available at home, she would definitely use word processing as a personal writing skill. Of the other four teachers, one had already been using word processing, and the remaining three adopted word processing as a personal writing activity as a result of their study activities. All but two teachers felt that word processing skills should be part of every teacher's repertoire of skills. The other two teachers felt that the skill was valuable for all teachers, and necessary for Language Arts teachers.

A concern was expressed that some teachers may feel compelled to include word processing in their Language Arts program for the wrong reasons, that is to 'jump on the bandwagon'. This attitude, or feeling of compulsion, would hamper a good writing program.

The obstacles perceived and faced by treatment group teachers confirm the issues of acceptance, access, and keyboarding, discussed in the "Review of the Literature" on page two.

4. **What teaching strategies encourage the use of word processors by students in elementary and secondary programs?**

In the early stages of using the word processor, the grade four teacher had her students write a draft copy of a story in the traditional manner. The students would then type the story into the word processor, with corrections. This teacher felt this was necessary due to the two students per computer ratio, resulting in uncertainty as to who was actually doing the writing. Later in the year, students were given a story idea 15 minutes before their scheduled computer access time. They would use the 15 minutes for prewriting activities, then go to the computer facility to write the draft copy and obtain a printed copy by the end of the session, returning to edit and print the final copy the next week. During the interlude students would show their stories to the teacher, and revisions would be discussed individually and as a class. The grade four teacher felt that this routine contributed to the improved writing quality that was evident. MECC View and Write (see Appendix B) was also used successfully by this teacher. During the video presentation, students were asked to jot down ideas and categorize words as nouns, adjectives, adverbs, and verbs. After this prewriting activity, the above routine would then be followed in the usual pattern.

MECC View and Write was used successfully by the grade five teacher in a similar fashion. Other writing starters included letters to Santa and letters to the school's Vice-Principal, outlining changes the students felt could be made to improve the school. As a mechanical skills practice, grade five students updated the top ten radio hits list each week, listing current chart position, position last week, song title, and recording artist. This required that the students master moving text techniques.

In addition to MECC View and Write, the grade six teacher made effective use of MECC Ghost Writer, and MECC Editor. This class had two lab access times during the week, once on Thursday, and once on Friday. Her students would follow the pattern of making an outline on Monday, discussing their ideas orally on Wednesday, writing the draft on Thursday, handing it into the teacher, and editing the marked draft on Friday. One problem encountered with this method was the dependency of the students on the teachers suggestions for clause movement. MECC Editor and MECC Ghost Writer helped alleviate this problem somewhat, but additional time in the computer facility would give the students more time to work on revision and become less dependent on the teacher for revision ideas.

The grade seven teacher started the students off on the word processor by studying sentence structure, avoiding paragraphs initially. The word processor was then used to combine sentences into paragraphs. Bonus marks were given to the more prolific student writers, encouraging them to write more. This teacher felt that the delay of one week between each scheduled computer access time resulted in lost time getting back on track. In addition she felt that her own failure to practice with the word processor resulted in a lot of lost time and declining discipline over failure to quickly resolve minor mechanical problems.

The grade eight teacher followed a similar pattern with his treatment group and his control group. He would take in the draft copy, mark it and return it to the students for editing, then mark the final draft. During the marking and discussion, he would stress the particular unit being currently dealt with, for example punctuation. This treatment class also had two sessions per week in the computer lab, and this allowed for more immediate reinforcement of the skills being dealt with. This teacher's approach of matching strategies between treatment group and control group treats the word processor as a writing tool that bears little difference to traditional tools, other than easing the tasks. Instructing in the computer lab was found to be less desirable than a classroom due to the distraction of the machinery. It was felt that instruction should precede movement to the lab.

The grade nine teacher was successful with a number of story activities, one of which was a variation on musical chairs. Each student would start a story at the computer in front of him by writing the first sentence. The class would then rotate, each student moving one computer to the left or right, and continue the story started by the previous student. A group newspaper project was less successful, due mainly to the time of year. The teacher felt this project would have worked well if performed in conjunction with the unit on newspapers. When introducing word processing the next time around, this teacher felt he would start with shorter assignments. This would give the students more immediate feedback and experience with editing using a word processor.

All junior high teachers felt they would like to try introduction of word processing using daily exposure in the beginning, tapering to periodic access towards the end of the year.

5. How does the integration of word processors into Language Arts affect student learning, behaviors, and attitudes?

Two observations made by most teachers early in the study are worthy of note. First, students had to concentrate on learning the word processor and consequently spent significantly less time and thought on Language Arts concepts. As the year progressed, mastery of the word processor allowed them to concentrate their efforts on Language. This is perhaps best illustrated by the grade eight teacher's observations:

> "Jan 14: In 8E (control group) I found I was spending a lot of time assisting students with phrasing, topic sentences, grammar, etc. In 8D (treatment group) I was too busy correcting computer problems to spend any time at all on Language Arts."

"Feb. 26: The type of questions asked by students was at first almost totally computer related. It then changed to approximately 50/50 (computer/ Language Arts) and later regressed to more computer related questions as new, possible advantages of the computer were explained. Work at the computer lags behind the control group's work and the control group seems to spend more time thinking about the quality of their work as opposed to quantity and error corrections."

"May 29: The likelihood of receiving work completed from all students remains about the same for both groups. The computer group seems more willing to catch up, but are limited by access to the computers. Students are using ability to move sentences more whereas control group would not consider reorganizing - too much effort."

These observations agree with the literature review discussion on access, as it took a considerable amount of access and practice before the word processor became a familiar writing tool for these students. Once they accepted it as such, access to the machines was less than adequate to accomplish the desired amount of revision.

The second observation was that of enthusiasm on the part of the students. The grade 4 teacher observed that her students no longer groaned when asked to write a story. All treatment classes were enthusiastic about using the computers to begin with, and the enthusiasm did not seem to wane as the project progressed. An informal question asked of some classes in the latter stages of the project was "Do you prefer to write using the word processor?". The researcher felt that the response from the majority of students was a strong yes.

Grade nine students were allowed to use MECC Writer when writing the Language Arts Achievement Test in June. Nine students elected to do so. One student found the word processor to be less advantageous than anticipated, due to her lack of typing skill. Another said he found it very advantageous, as he was able to continue revising longer than if he had had to take time to write a longhand finished copy. There are some serious implications for future testing. If keyboarding and word processing are to be encouraged, then it is unfair to deny access to the word processor when testing.

Improved quality of writing was noted by the grades 4, 5, 6, and 8 teachers, however the grade eight teacher felt the quality improvement may have been due to the regularity of writing activity. The grade nine teacher observed improved quality in some cases, but felt quality may have slipped in other cases. The regularity of the writing activity, and the increased practice in editing as a result of word processing may have been a contributing factor for the elementary classes. All teachers appreciated the ease of reading student work, and the resulting ease of spotting mistakes.

Revision at the grade four level was mostly minor, and related to grammar, spelling, and punctuation correction. Grade five students started the year with minor revisions, but later there was evidence of major revisions involving rearranging, addition, and deletion of ideas. About half of the grade six students were observed to progress to major revisions, while the other half was satisfied with minor revisions. Grade seven revisions were of a minor nature only, but the grade seven teacher felt that the one week delay between drafting a copy and return of a marked draft contributed to this. Had the students been able to receive immediate feedback, she felt major revision was likely to occur. Towards the latter stages of the project, the grade eight treatment students were observed to make major revisions, while the control group would not make major revisions unless directly instructed to do so (see above comments from this teacher's diary). The grade nine teacher felt that the students that were observed to make major revisions were those students who were likely to do so if writing longhand. The frequency of major revision increased however, with the introduction of an autobiography project, and the introduction of MECC Editor and MECC Speller.

Perhaps the most important teacher insights were those shared when the teachers were asked to indicate which students they felt gained the most. The response was that virtually all students profited by the experience, but that those with poor handwriting gained more than other students. There was a distinct feeling of pride in workmanship on the part of some students with poor handwriting; a feeling that was absent when writing longhand. Students of higher academic achievement were also felt to have profited more from the experience than students of average achievement. Generally teachers felt that word processing was an ability or skill that helped good writers write better, but also encouraged reluctant writers to write more and revise more due to the ease of doing so. The quality look of the final product and the ease of editing eventually encouraged most students to write more, but the effect was not instantaneous. It took most of the study duration before these effects were noted.

It was felt that the project duration was too short to show dramatic gains in the quality of student writing, as it was not until the latter stages of the project that students were familiar enough with the mechanics of word processing to concentrate on revision. At this point access became a major problem, as observed by the grade eight teacher earlier. There is no magic to the word processor; it is a utility that takes much of the drudgery out of revision. One must spent the time to learn word processor operation before there is any saving in effort. We should not expect dramatic quality gains until access to the word processor is less restricted than 80 minutes per week.

6. What are the salient features of effective school board policies regarding computer usage, particularly word processing, in schools?

During the course of this study, the County of Lacombe appointed a person to the temporary position of half time project coordinator, half time consultant. One of the most obvious needs perceived by the teachers was that of continued provision of inservice, both for those teachers currently using computers, and those not yet using them. In addition to the inservice requirements, teachers felt the need for continuation of the provision for a quickly available resource person. All felt that the continuation of the consultant position was desirable and necessary. Along with the commitment to the consultant position, should go a commitment to inservice reflected in release time for teachers to be inserviced. The County of Lacombe currently provides for financially subsidized attendance at one conference per school year per teacher. Teachers felt that attendance at the Alberta Teacher's Association Computer Council conference (ATACC) should be provided for as well as one other conference. Choosing to attend the ATACC conference under the current provisions, negates attendance at the Language Arts conference, thus impeding incorporation of computer technology into established disciplines.

Provisions need to be made for increased access to computer technology. The current demand far outstrips the supply in James S. McCormick Elementary and Lacombe Junior High School. A one student per computer ratio was recognized initially by all teachers as desirable, and subsequently affirmed as necessary, if word processing is to be given serious consideration. Attempts at student word processing without this degree of saturation are cursory at best and would not succeed if process writing were attempted. The number of computers at, and the creation of a new computer facility at, Lacombe Junior High School was a direct result of the demands of this study, as this facility served the treatment classes from both of the above schools. Even with this atypical facility, the supply of access time does not nearly meet the demand for access time. The increased local awareness caused by the study has placed increased demands on this facility in that more teachers want to involve their students in word processing. As a result, the grade four treatment group teacher has had her access time cut from 80 minutes once a week to 80 minutes once every four weeks, a far cry from the 120 minutes per week sought. Some elementary teachers are without any access in spite of their expressed desire for access.

The County of Lacombe maintains a MECC Software licence, and as such has the right to duplicate as many copies of specified MECC software as are required by county schools. Lack of software did not emerge as a concern to treatment group teachers, as they were provided with one copy of MECC Writer per student, and as many copies of the other licensed MECC Products as they felt they required. Software needs in County of Lacombe schools are meet through the MECC Licence and supplemental purchases from various suppliers. Policy is in place to prevent unauthorized duplication of computer software. Other jurisdictions need to plan and budget for adequate software to legally meet the needs of their students.

Hardware maintenance did not emerge as a significant concern, however the issue should also be addressed. Many Jurisdictions are not being faced with significant maintenance costs, as most of the equipment is relatively new. It is likely that hardware maintenance will become significant in the future.

B. Objective Measures

1. C.T.B.S. Results (Tables 3 - 14)

With the exception of grade six results, few significant differences in posttest means were noted. Grade six results (Table 7) show a significant difference in the Reading, Spelling, and Capitalization sub tests, yielding a significant difference in the means for all tests combined. Grade four results (Table 3) revealed a significant difference in the Usage subtest only, the trend however, was towards better treatment group performance. The grade five results (Table 5) revealed a significant difference in favor of the control group on the capitalization sub test pretest. This difference did not occur on the posttest. The opposite effect occurred on the reading pretest. The treatment group showed significantly better performance on the pretest, and no significant difference on the posttest. Grades seven, eight, and nine results (Tables 9, 11, and 13) showed no significant difference on any of the sub tests. There is a concern that C.T.B.S. testing may not measure writing ability, and a measure that relates more directly to student writing ability would perhaps have been a better choice to measure student learning.

2. S.S.A.S. Results (Tables 15 - 38)

Two significant results emerged from the grade four S.S.A.S. results. The Reading pretest showed a significantly poorer treatment group attitude that became an insignificant difference on the posttest (Table 15). In addition, the evaluation factor for all pretests was significantly poorer for the treatment group on the pretest, and again not significant on the post test (Table 18).

Grade five results showed no significant differences (Tables 19 - 22).

Grade six results showed a better treatment group attitude on the Language pretest that evaporated to no significant difference on the posttest (Table 24). This is reflected in the evaluation factor for All Subjects, however the treatment group showed an attitude improvement on the difficulty factor (Table 26).

A similar attitude improvement is reflected in the grade seven difficulty factor results for Reading (Table 27), Spelling (Table 29), and All Subjects (Table 30).

Grade eight results showed significant positive attitude shift in Reading evaluation, Reading Usefulness, and the overall Reading scores (Table 31). All three factors: evaluation, usefulness, and difficulty, showed significant improvement on the Spelling scale (Table 33). The Language results showed a decline in treatment group attitude from a significantly better attitude on the pretest to no significant difference on the posttest (Table 32).

Grade nine results show significant negative movement on the part of the treatment group in Reading evaluation, Reading Usefulness, and the overall reading result (Table 35). A similar shift was found in Spelling usefulness, and spelling overall results (Table 37). The results for All Subjects reflect this shift in evaluation, and all tests (Table 38).

The implications of the above results are discussed in Chapter Four.

CHAPTER FOUR

DISCUSSION AND RECOMMENDATIONS

The subjective findings require little further discussion. The objective results relating to student learning and attitudes are discussed further in this chapter.

A. Discussion

1. Canadian Tests of Basic Skills

There are perhaps two reasons that a more dramatic shift did not occur on C.T.B.S. results. Firstly, the comments of the grade 8 teacher quoted earlier reflect the duration of time required before treatment group students adopted a willingness to revise that was not present in the control group. It was not until the latter part of May that this difference occurred. In the earlier stages of the study, the treatment group was in fact, able to spend less time on Language Arts and writing activity, as they had the additional burden of learning to operate a word processor.

Secondly, we must not expect any magic to occur due to the word processor. It is a tool, albeit a powerful one, that takes the drudgery out of revision. One should not expect improvement in writing because the writing was accomplished with the aid of a word processor, rather we should expect improvement in writing because practice at revision will no doubt improve the quality of revision, and the word processor encourages revision. The willingness to revise noted by the grade 8 teacher still was not translated into action due to the lack of access to the computer. Practice needs to be significant, and the opportunity afforded treatment group students by this study was limited. Junior high teachers in fact, had treatment and control groups complete the same amount of writing during the study.

If we accept that a major component of writing is revision, then we should not expect dramatic gains until the operation of the word processor is second nature, and the dual problems of keyboarding and access, as discussed in the Review of the Literature, are effectively dealt with. In light of the comments from the grade eight teacher's diary, one might in fact argue, that the lack of significant difference in results speaks in favor of the introduction of word processing. The students did not suffer as a result of having to master the new skills associated with word processing.

In spite of these problems and restrictions, the grade six treatment class showed significantly more improvement over the control class on C.T.B.S. tests, and no group showed any evidence of suffering as a result of their word processing experiences.

2. School Subjects Attitude Scales.

The most significant treatment group attitude improvements can be noted on the Spelling and Reading scales for grade eight. In addition, there are a few isolated cases of significantly better attitudes on the part of treatment group students. There are also a few isolated cases of significantly poorer treatment group attitudes. The grades 6 and 8 language attitudes declined from a significantly better pretest attitude on the part of the treatment group, to no significant posttest difference. This may have been due to the increased effort required of students to write as a result of involvement in the project.

The significant decline in attitude on the part grade nine treatment group students is felt to be a direct result of circumstances during the administration of the posttest. The test administrator noted an unusually boisterous and undisciplined class at the time of the posttest administration. A fear of contaminated results was expressed at that time by the administrator, and the results would seem to substantiate that fear. It was apparently, a bad day to test that group.

If grade nine results are excepted for the above reason, the general trend in treatment group attitudes is positive, with significant differences occurring in grade 8 Spelling and Reading.

3. General Discussion

All treatment group teachers felt they would like to continue use of word processing in their classes, and their involvement during the 1985-86 school year has had a spin off effect in that more teachers within the school division want to incorporate word processing during the 1986-87 school year. The positive effects apparent from the subjective measures are sufficient evidence to continue the use of word processing. The first issue identified in Chapter One, teacher acceptance, is apparently being effectively dealt with in the County of Lacombe. So much so that access has become a more acute problem. The third issue, keyboarding, is being partially addressed through the use of MECC Keyboarding Primer. The increased demand for access limits the ability to effectively deal with keyboarding, as treatment group teachers are finding it difficult to maintain the access time provided in 1985-86, let aside increasing access time.

The second issue, access, is unlikely to be solved until new facilities can be built, and more equipment purchased. Demand for facilities that are already overcrowded is increasing. The forth issue, educational effects, would appear to be contingent upon increased keyboarding instruction and increased access. The objective results of this study indicated some significant improvement, but observations by the teachers involved indicated access and keyboarding limited full application of the newly learned student skills. It is apparent that further research needs to be conducted. Perhaps research that can negate the issues of access and keyboarding, allowing students to revise at will.

B. Recommendations

1. It is recommended that keyboarding and word processing become part of the Language Arts curriculum in grades 4, 5, and 6, by decreasing allotted time for all other subjects. A possible scenario would see keyboarding taught for 30 minutes per day, four days per week, for the first nine weeks at grade four. A gradual shift in emphasis to the mechanics of word processing would occur towards the end of the nine week period. Gradually through the remainder of the year, emphasis would shift from mechanics to the use of the word processor as a tool for writing. Grades five and six would start the year with additional keyboarding instruction, then more advanced mechanical operations, and again make the shift to word processing as a means to writing.

2. Keyboarding and word processing at the division III level is at a beginning level at this point, due to the lack of instruction currently being done in division II. A period of catch up should be initiated at the same time that keyboarding and word processing are included in division II curriculum. All students at grade seven could receive 35 minutes per day of keyboarding instruction for nine weeks at the beginning of the school year. Add another week to teach the basics of a simple word processor such as MECC Writer, then the scheduled time becomes part of their Language Arts time. The first ten weeks would not be Language Arts time however, but time taken from all subject areas.

Once the students that were taught these skills in elementary grades start to reach grade seven, there would no longer be a need for mechanical instruction, and word processing could be a Language Arts activity for all students within the existing curriculum. A writing option for those students especially interested in writing should also be considered.

3. Along with inclusion of word processing in the curriculum, Alberta Education should include within the curriculum guide, suggested lessons and resources for the teaching of word processing and touch typing, with specific software designated as primary resources.

4. Alberta Education should continue to provide grants for inservicing teachers.

5. A similar program to the BQRP Business Education Equipment Upgrade program should be developed for elementary and junior high school hardware and software.

6. Alberta Universities should include instruction on word processing in all teacher education programs, and instruction on the teaching of touch typing in elementary education programs.

7. School jurisdictions need to provide resources, including personnel, release time for teachers, software, and hardware to facilitate the inservicing of teachers in the use of word processing technology. The Computer Consultant position in the County of Lacombe has raised awareness, usage, and inservice levels dramatically throughout the county. A similar position should be considered by all jurisdictions.

8. The minimum supply of hardware should be a class set of computers available to all classes in Divisions II and III.

9. Provision for a sufficient supply of software that is readily accessible to classroom teachers should be policy in every jurisdiction.

10. School jurisdictions wanting to raise the level of computer usage and awareness should consider attendance at the Alberta Teacher's Association Computer Council Annual Conference as an activity valuable to all teachers, not just computer specialists. Attendance at this conference should not jeopardize attendance at other specialist conferences.

11. Further research should be conducted into the educational effects of word processing. Measurement of student writing skills should be considered in addition to, or instead of, basic skills measurement.

Table 1 - List of Participating Classes

School	Surname	Grade	Status	# Students	Lab Time	Min/wk
Lower Elementary	Flewelling	4	Control	20	n/a	n/a
Lower Elementary	MacAskill,M	4	Treatment	22	Tu 12:45-2:15	90
Upper Elementary	Jones	5	Control	22	n/a	n/a
Bentley	MacAskill,A	5	Treatment	17	Mo 10:30-11:10/Th 12:35-1:15	80
Upper Elementary	Barnhart	6	Control	23	n/a	n/a
Upper Elementary	McLaughlin	6	Treatment	22	Th 12:45-1:15/Fr 10:20-11:15	85
Lacombe Jr. High	Fenske	7B	Control	25	n/a	n/a
Lacombe Jr. High	Fenske	7C	Treatment	24	Mo 12:50-2:10	80
Lacombe Jr. High	Kenworthy	8E	Control	24	n/a	n/a
Lacombe Jr. High	Kenworthy	8D	Treatment	23	Tu/Th 10:30-11:40	80
Lacombe Jr. High	Foley	9C	Control	26	n/a	n/a
Lacombe Jr. High	Foley	9D	Treatment	26	Mo 10:30-11:40/Fr 12:50-1:30	80

Table 2 - Schedule of C.T.B.S. AND S.S.A.S. Testing

Canadian Tests of Basic Skills Testing Schedule

Class	Pretest	Posttest
4 Control	Jan 85*	Jun 86
4 Treatment	Jan 85*	Jun 86
5 Control	Jan 85	May 86
5 Treatment	Jun 85	May 86
6 Control	Jan 85	May 86
6 Treatment	Jan 85	Jun 86
7 Control	Jan 85	Apr 86
7 Treatment	Jan 85	Apr 86
8 Control	Nov 85	May 86
8 Treatment	Nov 85	May 86
9 Control	Nov 85	Jun 86
9 Treatment	Nov 85	Jun 86

* Most students were pretested Jan 85, but some were tested Mar 85 and June 85

School Subjects Attitude Scales Testing Schedule

Class	Pretest	Posttest
4 Control	Nov 85	May 86
4 Treatment	Nov 85	May 86
5 Control	Nov 85	May 86
5 Treatment	Nov 85	May 86
6 Control	Nov 85	May 86
6 Treatment	Nov 85	May 86
7 Control	Nov 85	May 86
7 Treatment	Nov 85	May 86
8 Control	Nov 85	May 86
8 Treatment	Nov 85	May 86
9 Control	Nov 85	May 86
9 Treatment	Nov 85	May 86

Table 3 - Grade 4 C.T.B.S. Results

t-Tests for Grade 4 C.T.B.S. Results (Grade Equivalents)
t-table values represent .05 significance

Pretest:

Vocabulary:	Mean	Sd	n		
Treatment	4.1	1	16	t=	1.221
				t-Table=	1.708
Control	3.7	.5	11	Sig:	no

Reading:	Mean	Sd	n		
Treatment	4.1	.9	16	t=	1.287
				t-Table=	1.708
Control	3.7	.6	11	Sig:	no

Spelling:	Mean	Sd	n		
Treatment	4.2	1.2	16	t=	0.000
				t-Table=	1.708
Control	4.2	1.1	11	Sig:	no

Capital:	Mean	Sd	n		
Treatment	4	1.1	16	t=	1.546
				t-Table=	1.708
Control	3.4	.8	11	Sig:	no

Punctuation:	Mean	Sd	n		
Treatment	3.6	1.3	16	t=	.453
				t-Table=	1.708
Control	3.4	.8	11	Sig:	no

Usage:	Mean	Sd	n		
Treatment	3.9	1.1	16	t=	.747
				t-Table=	1.708
Control	3.6	.9	11	Sig:	no

All Tests:	Mean	Sd	n		
Treatment	3.99	.85	16	t=	1.057
				t-Table=	1.708
Control	3.67	.64	11	Sig:	no

Posttest:

Vocabulary:	Mean	Sd	n		
Treatment	5.2	.9	16	t=	.643
				t-Table=	1.708
Control	5	.6	11	Sig:	no

Reading:	Mean	Sd	n		
Treatment	4.8	1.1	16	t=	.481
				t-Table=	1.708
Control	4.6	1	11	Sig:	no

Spelling:	Mean	Sd	n		
Treatment	5.8	1.2	16	t=	1.193
				t-Table=	1.708
Control	5.2	1.4	11	Sig:	no

Capital:	Mean	Sd	n		
Treatment	5.1	1.3	16	t=	1.178
				t-Table=	1.708
Control	4.5	1.3	11	Sig:	no

Punctuation:	Mean	Sd	n		
Treatment	5.2	1.4	16	t=	1.126
				t-Table=	1.708
Control	4.6	1.3	11	Sig:	no

Usage:	Mean	Sd	n		
Treatment	5	1	16	t=	2.207
				t-Table=	1.708
Control	4.1	1.1	11	Sig:	yes

All Tests:	Mean	Sd	n		
Treatment	5.21	.95	16	t=	1.392
				t-Table=	1.708
Control	4.69	.96	11	Sig:	no

Table 4 - Grade 4 C.T.B.S. Mean Gain

```
                    T-Tests for Grade 4 C.T.B.S. Mean Gain
                    t-Table values represent  .05 significance

   Gain:
                Mean
 Vocabulary: ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
   Study     ¦      1.1¦       .8¦       16¦      t=-.7027284
             ¦---------¦---------¦---------¦ t-Table=    1.708
   Control   ¦      1.3¦       .6¦       11¦    Sig:        no

                Mean
 Reading:    ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
   Study     ¦       .8¦      1.1¦       16¦      t=-.2576432
             ¦---------¦---------¦---------¦ t-Table=    1.708
   Control   ¦       .9¦       .8¦       11¦    Sig:        no

                Mean
 Spelling:   ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
   Study     ¦      1.6¦       .9¦       16¦      t=1.6274544
             ¦---------¦---------¦---------¦ t-Table=    1.708
   Control   ¦      1.0¦      1.0¦       11¦    Sig:        no

                Mean
 Capital:    ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
   Study     ¦      1.1¦      1.3¦       16¦      t=         0
             ¦---------¦---------¦---------¦ t-Table=    1.708
   Control   ¦      1.1¦      1.4¦       11¦    Sig:        no

                Mean
 Punctuation:¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
   Study     ¦      1.6¦      1.6¦       16¦      t= .5149952
             ¦---------¦---------¦---------¦ t-Table=    1.708
   Control   ¦      1.3¦      1.3¦       11¦    Sig:        no

                Mean
 Usage:      ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
   Study     ¦      1.1¦       .8¦       16¦      t=1.6442424
             ¦---------¦---------¦---------¦ t-Table=    1.708
   Control   ¦       .5¦      1.1¦       11¦    Sig:        no

                Mean
 All Tests:  ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
   Study     ¦      1.2¦       .5¦       16¦      t= .8543515
             ¦---------¦---------¦---------¦ t-Table=    1.708
   Control   ¦      1.0¦       .7¦       11¦    Sig:        no
```

Table 5 - Grade 5 C.T.B.S. Results

t-Tests for Grade 5 C.T.B.S. Results (Grade Equivalents)
t-table values represent .05 significance

Pretest:

Vocabulary:	Mean	Sd	n		
Treatment	5.1	1	17	t=	.320
				t-Table=	1.690
Control	5	.9	20	Sig:	no

Reading:	Mean	Sd	n		
Treatment	5.6	.9	17	t=	2.358
				t-Table=	1.690
Control	4.9	.9	20	Sig:	yes

Spelling:	Mean	Sd	n		
Treatment	5.1	1	17	t=	-1.089
				t-Table=	1.690
Control	5.5	1.2	20	Sig:	no

Capital:	Mean	Sd	n		
Treatment	4.6	1.2	17	t=	-1.814
				t-Table=	1.690
Control	5.2	.8	20	Sig:	yes

Punctuation:	Mean	Sd	n		
Treatment	5.1	1.2	17	t=	.553
				t-Table=	1.690
Control	4.9	1	20	Sig:	no

Usage:	Mean	Sd	n		
Treatment	5	1.1	17	t=	0.000
				t-Table=	1.690
Control	5	.9	20	Sig:	no

All Tests:	Mean	Sd	n		
Treatment	5.09	.87	17	t=	.076
				t-Table=	1.690
Control	5.07	.74	20	Sig:	no

Posttest:

Vocabulary:	Mean	Sd	n		
Treatment	6.3	.9	17	t=	.952
				t-Table=	1.690
Control	6	1	20	Sig:	no

Reading:	Mean	Sd	n		
Treatment	6.2	.9	17	t=	.674
				t-Table=	1.690
Control	6	.9	20	Sig:	no

Spelling:	Mean	Sd	n		
Treatment	6	1.1	17	t=	-1.158
				t-Table=	1.690
Control	6.4	1	20	Sig:	no

Capital:	Mean	Sd	n		
Treatment	6.5	.9	17	t=	1.336
				t-Table=	1.690
Control	6	1.3	20	Sig:	no

Punctuation:	Mean	Sd	n		
Treatment	6.4	1.2	17	t=	-1.106
				t-Table=	1.690
Control	6.8	1	20	Sig:	no

Usage:	Mean	Sd	n		
Treatment	6.3	1.1	17	t=	.304
				t-Table=	1.690
Control	6.2	.9	20	Sig:	no

All Tests:	Mean	Sd	n		
Treatment	6.27	.82	17	t=	.151
				t-Table=	1.690
Control	6.23	.79	20	Sig:	no

Table 6 - Grade 5 C.T.B.S. Mean Gain

```
                    T-Tests for Grade 5 C.T.B.S. Mean Gain
                    t-Table values represent  .05 significance

  Gain:
                Mean
 Vocabulary: ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
  Study      ¦      1.2¦       .6¦       17¦      t= .9239447
             ¦---------¦---------¦---------¦ t-Table=    1.609
  Control    ¦      1.0¦       .7¦       20¦    Sig:         no

                Mean
 Reading:    ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
  Study      ¦       .6¦       .9¦       17¦      t= -2.28015
             ¦---------¦---------¦---------¦ t-Table=    1.609
  Control    ¦      1.2¦       .7¦       20¦    Sig:        yes

                Mean
 Spelling:   ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
  Study      ¦       .9¦       .9¦       17¦      t=          0
             ¦---------¦---------¦---------¦ t-Table=    1.609
  Control    ¦       .9¦       .7¦       20¦    Sig:         no

                Mean
 Capital:    ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
  Study      ¦      1.9¦      1.2¦       17¦      t=2.6563943
             ¦---------¦---------¦---------¦ t-Table=    1.609
  Control    ¦       .8¦      1.3¦       20¦    Sig:        yes

                Mean
 Punctuation:¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
  Study      ¦      1.3¦      1.0¦       17¦      t= -1.51568
             ¦---------¦---------¦---------¦ t-Table=    1.609
  Control    ¦      1.8¦      1.0¦       20¦    Sig:         no

                Mean
 Usage:      ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
  Study      ¦      1.3¦      1.1¦       17¦      t=          0
             ¦---------¦---------¦---------¦ t-Table=    1.609
  Control    ¦      1.3¦      1.1¦       20¦    Sig:         no

                Mean
 All Tests:  ¦  Gain   ¦   Sd    ¦    n    ¦
             ¦---------¦---------¦---------¦
  Study      ¦      1.2¦       .6¦       17¦      t= .1200856
             ¦---------¦---------¦---------¦ t-Table=    1.609
  Control    ¦      1.2¦       .4¦       20¦    Sig:         no
```

Table 7 - Grade 6 C.T.B.S. Results

t-Tests for Grade 6 C.T.B.S. Results (Grade Equivalents)
t-table values represent .05 significance

Pretest:

Vocabulary:	Mean	Sd	n		
Treatment	5.9	1	20	t=	1.060
				t-Table=	1.688
Control	5.6	.7	18	Sig:	no

Reading:	Mean	Sd	n		
Treatment	6.1	1.2	20	t=	.864
				t-Table=	1.688
Control	5.8	.9	18	Sig:	no

Spelling:	Mean	Sd	n		
Treatment	6.2	1	20	t=	.560
				t-Table=	1.688
Control	6	1.2	18	Sig:	no

Capital:	Mean	Sd	n		
Treatment	6.4	1.3	20	t=	.913
				t-Table=	1.688
Control	6	1.4	18	Sig:	no

Punctuation:	Mean	Sd	n		
Treatment	6.4	1.1	20	t=	1.027
				t-Table=	1.688
Control	6	1.3	18	Sig:	no

Usage:	Mean	Sd	n		
Treatment	6.3	1.1	20	t=	1.876
				t-Table=	1.688
Control	5.6	1.2	18	Sig:	yes

All Tests:	Mean	Sd	n		
Treatment	6.23	.93	20	t=	1.358
				t-Table=	1.688
Control	5.83	.88	18	Sig:	no

Posttest:

Vocabulary:	Mean	Sd	n		
Treatment	7.2	.8	20	t=	.725
				t-Table=	1.688
Control	7	.9	18	Sig:	no

Reading:	Mean	Sd	n		
Treatment	7.4	.7	20	t=	2.520
				t-Table=	1.688
Control	6.7	1	18	Sig:	yes

Spelling:	Mean	Sd	n		
Treatment	7.8	.9	20	t=	2.047
				t-Table=	1.688
Control	7.1	1.2	18	Sig:	yes

Capital:	Mean	Sd	n		
Treatment	7.7	1.1	20	t=	2.311
				t-Table=	1.688
Control	6.8	1.3	18	Sig:	yes

Punctuation:	Mean	Sd	n		
Treatment	7.8	1.2	20	t=	1.539
				t-Table=	1.688
Control	7.2	1.2	18	Sig:	no

Usage:	Mean	Sd	n		
Treatment	7.4	.9	20	t=	.649
				t-Table=	1.688
Control	7.2	1	18	Sig:	no

All Tests:	Mean	Sd	n		
Treatment	7.54	.77	20	t=	2.080
				t-Table=	1.688
Control	7.01	.8	18	Sig:	yes

Table 8 - Grade 6 C.T.B.S. Mean Gain

T-Tests for Grade 6 C.T.B.S. Mean Gain
t-Table values represent .05 significance

Gain:

Vocabulary:	Mean Gain	Sd	n		
Study	1.3	.5	20	t=	-.5601392
				t-Table=	1.688
Control	1.4	.6	18	Sig:	no

Reading:	Mean Gain	Sd	n		
Study	1.2	.7	20	t=	1.319115
				t-Table=	1.688
Control	.9	.7	18	Sig:	no

Spelling:	Mean Gain	Sd	n		
Study	1.5	.8	20	t=	1.5389675
				t-Table=	1.688
Control	1.1	.8	18	Sig:	no

Capital:	Mean Gain	Sd	n		
Study	1.4	1.2	20	t=	1.2824729
				t-Table=	1.688
Control	.9	1.2	18	Sig:	no

Punctuation:	Mean Gain	Sd	n		
Study	1.3	.8	20	t=	.3050935
				t-Table=	1.688
Control	1.2	1.2	18	Sig:	no

Usage:	Mean Gain	Sd	n		
Study	1.2	.7	20	t=	-1.13139
				t-Table=	1.688
Control	1.6	1.4	18	Sig:	no

All Tests:	Mean Gain	Sd	n		
Study	1.31	.44	20	t=	.6997245
				t-Table=	1.688
Control	1.18	.69	18	Sig:	no

Table 9 - Grade 7 C.T.B.S. Results

t-Tests for Grade 7 C.T.B.S. Results (Grade Equivalents)
t-table values represent .05 significance

Pretest:

		Mean	Sd	n		
Vocabulary:	Treatment	6.5	1.1	22	t=	-.894
					t-Table=	1.683
	Control	6.8	1.1	21	Sig:	no
Reading:	Treatment	7.1	.8	22	t=	0.000
					t-Table=	1.683
	Control	7.1	1.1	21	Sig:	no
Spelling:	Treatment	6.4	1.4	22	t=	0.000
					t-Table=	1.683
	Control	6.4	1.4	21	Sig:	no
Capital:	Treatment	6.7	1.6	22	t=	0.000
					t-Table=	1.683
	Control	6.7	1.2	21	Sig:	no
Punctuation:	Treatment	6.8	1.2	22	t=	0.000
					t-Table=	1.683
	Control	6.8	1.3	21	Sig:	no
Usage:	Treatment	6.6	1.3	22	t=	-.262
					t-Table=	1.683
	Control	6.7	1.2	21	Sig:	no
All Tests:	Treatment	6.68	1.03	22	t=	-.232
					t-Table=	1.683
	Control	6.75	.94	21	Sig:	no

Posttest:

		Mean	Sd	n		
Vocabulary:	Treatment	7.5	1.1	22	t=	-1.140
					t-Table=	1.683
	Control	7.9	1.2	21	Sig:	no
Reading:	Treatment	7.5	1.7	22	t=	-.210
					t-Table=	1.683
	Control	7.6	1.4	21	Sig:	no
Spelling:	Treatment	7.4	1.3	22	t=	.225
					t-Table=	1.683
	Control	7.3	1.6	21	Sig:	no
Capital:	Treatment	7.4	1.3	22	t=	.486
					t-Table=	1.683
	Control	7.2	1.4	21	Sig:	no
Punctuation:	Treatment	7.2	1.6	22	t=	-.462
					t-Table=	1.683
	Control	7.4	1.2	21	Sig:	no
Usage:	Treatment	7.6	1.6	22	t=	-.218
					t-Table=	1.683
	Control	7.7	1.4	21	Sig:	no
All Tests:	Treatment	7.43	1.2	22	t=	-.275
					t-Table=	1.683
	Control	7.53	1.18	21	Sig:	no

Table 10 - Grade 7 C.T.B.S. Mean Gain

```
T-Tests for Grade 7 C.T.B.S. Mean Gain
t-Table values represent  .05 significance

   Gain:
                Mean
Vocabulary: ¦ Gain   ¦   Sd    ¦    n    ¦
            ¦--------¦---------¦---------¦
   Study    ¦    1.0¦       .6¦       22¦      t=-.5463054
            ¦--------¦---------¦---------¦ t-Table=    1.683
   Control  ¦    1.1¦       .6¦       21¦     Sig:        no

                Mean
Reading:    ¦ Gain   ¦   Sd    ¦    n    ¦
            ¦--------¦---------¦---------¦
   Study    ¦     .4¦      1.3¦       22¦      t=-.3118728
            ¦--------¦---------¦---------¦ t-Table=    1.683
   Control  ¦     .5¦       .7¦       21¦     Sig:        no

                Mean
Spelling:   ¦ Gain   ¦   Sd    ¦    n    ¦
            ¦--------¦---------¦---------¦
   Study    ¦    1.1¦       .9¦       22¦      t= .6900001
            ¦--------¦---------¦---------¦ t-Table=    1.683
   Control  ¦     .9¦      1.0¦       21¦     Sig:        no

                Mean
Capital:    ¦ Gain   ¦   Sd    ¦    n    ¦
            ¦--------¦---------¦---------¦
   Study    ¦     .7¦      1.4¦       22¦      t= .2509307
            ¦--------¦---------¦---------¦ t-Table=    1.683
   Control  ¦     .6¦      1.2¦       21¦     Sig:        no

                Mean
Punctuation:¦ Gain   ¦   Sd    ¦    n    ¦
            ¦--------¦---------¦---------¦
   Study    ¦     .4¦      1.3¦       22¦      t=-.5042819
            ¦--------¦---------¦---------¦ t-Table=    1.683
   Control  ¦     .6¦      1.3¦       21¦     Sig:        no

                Mean
Usage:      ¦ Gain   ¦   Sd    ¦    n    ¦
            ¦--------¦---------¦---------¦
   Study    ¦    1.0¦       .9¦       22¦      t=          0
            ¦--------¦---------¦---------¦ t-Table=    1.683
   Control  ¦    1.0¦      1.1¦       21¦     Sig:        no

                Mean
All Tests:  ¦ Gain   ¦   Sd    ¦    n    ¦
            ¦--------¦---------¦---------¦
   Study    ¦     .8¦       .5¦       22¦      t=-.1259342
            ¦--------¦---------¦---------¦ t-Table=    1.683
   Control  ¦     .8¦       .6¦       21¦     Sig:        no
```

Table 11 - Grade 8 C.T.B.S. Results

t-Tests for Grade 8 C.T.B.S. Results (Grade Equivalents)
t-table values represent .05 significance

Pretest:

Vocabulary:	Mean	Sd	n		
Treatment	8.2	1.2	21	t=	-.603
				t-Table=	1.682
Control	8.4	1	23	Sig:	no

Reading:	Mean	Sd	n		
Treatment	8.1	1.7	21	t=	-1.520
				t-Table=	1.682
Control	8.7	.8	23	Sig:	no

Spelling:	Mean	Sd	n		
Treatment	8.9	1.8	21	t=	-.402
				t-Table=	1.682
Control	9.1	1.5	23	Sig:	no

Capital:	Mean	Sd	n		
Treatment	8.8	1.3	21	t=	.979
				t-Table=	1.682
Control	8.4	1.4	23	Sig:	no

Punctuation:	Mean	Sd	n		
Treatment	8.8	1.5	21	t=	-.245
				t-Table=	1.682
Control	8.9	1.2	23	Sig:	no

Usage:	Mean	Sd	n		
Treatment	8.5	1.9	21	t=	.216
				t-Table=	1.682
Control	8.4	1.1	23	Sig:	no

All Tests:	Mean	Sd	n		
Treatment	8.56	1.32	21	t=	-.291
				t-Table=	1.682
Control	8.66	.94	23	Sig:	no

Posttest:

Vocabulary:	Mean	Sd	n		
Treatment	8.5	1.5	21	t=	-.507
				t-Table=	1.682
Control	8.7	1.1	23	Sig:	no

Reading:	Mean	Sd	n		
Treatment	8.7	1.5	21	t=	.245
				t-Table=	1.682
Control	8.6	1.2	23	Sig:	no

Spelling:	Mean	Sd	n		
Treatment	8.9	1.9	21	t=	-.616
				t-Table=	1.682
Control	9.2	1.3	23	Sig:	no

Capital:	Mean	Sd	n		
Treatment	8.9	1.6	21	t=	1.002
				t-Table=	1.682
Control	8.4	1.7	23	Sig:	no

Punctuation:	Mean	Sd	n		
Treatment	9.1	1.7	21	t=	.804
				t-Table=	1.682
Control	8.7	1.6	23	Sig:	no

Usage:	Mean	Sd	n		
Treatment	8.5	1.8	21	t=	-.225
				t-Table=	1.682
Control	8.6	1.1	23	Sig:	no

All Tests:	Mean	Sd	n		
Treatment	8.77	1.49	21	t=	.127
				t-Table=	1.682
Control	8.72	1.1	23	Sig:	no

Table 12 - Grade 8 C.T.B.S. Mean Gain

T-Tests for Grade 8 C.T.B.S. Mean Gain
t-Table values represent .05 significance

Gain:

Vocabulary:	Mean Gain	Sd	n		
Study	.3	.9	21	t:	0
				t-Table:	1.682
Control	.3	.5	23	Sig:	no

Reading:	Mean Gain	Sd	n		
Study	.6	1.1	21	t:	2.1782776
				t-Table:	1.682
Control	0.0	.7	23	Sig:	yes

Spelling:	Mean Gain	Sd	n		
Study	0.0	.7	21	t:	-.4393946
				t-Table:	1.682
Control	.1	.8	23	Sig:	no

Capital:	Mean Gain	Sd	n		
Study	.1	1.3	21	t:	.3103093
				t-Table:	1.682
Control	0.0	.8	23	Sig:	no

Punctuation:	Mean Gain	Sd	n		
Study	.2	.8	21	t:	1.5521342
				t-Table:	1.682
Control	-.2	.9	23	Sig:	no

Usage:	Mean Gain	Sd	n		
Study	0.0	1.0	21	t:	-.7740474
				t-Table:	1.682
Control	.2	.7	23	Sig:	no

All Tests:	Mean Gain	Sd	n		
Study	.2	.4	21	t:	1.3751745
				t-Table:	1.682
Control	.1	.3	23	Sig:	no

Table 13 - Grade 9 C.T.B.S. Results

t-Tests for Grade 9 C.T.B.S. Results (Percintile Ranks)
t-table values represent .05 significance

Pretest:

Reading:	Mean	Sd	n		
Treatment	62.40	28.56	25	t=	1.085
				t Table=	1.679
Control	53.13	30.64	23	Sig:	no

Written:	Mean	Sd	n		
Treatment	62.00	31.70	25	t=	-.137
				t Table=	1.679
Control	63.17	27.21	23	Sig:	no

All Tests:	Mean	Sd	n		
Treatment	62.20	29.40	25	t=	.500
				t Table=	1.679
Control	58.15	26.39	23	Sig:	no

Posttest:

Reading:	Mean	Sd	n		
Treatment	60.96	31.16	25	t=	.777
				t Table=	1.679
Control	54.17	29.19	23	Sig:	no

Written:	Mean	Sd	n		
Treatment	59.20	28.96	25	t=	-.066
				t Table=	1.679
Control	59.74	27.35	23	Sig:	no

All Tests:	Mean	Sd	n		
Treatment	60.08	28.68	25	t=	.242
				t Table=	1.679
Control	58.15	26.39	23	Sig:	no

Table 14 - Grade 9 C.T.B.S. Mean Gain

T-Tests for Grade 9 C.T.B.S. Mean Gain
t-Table values represent .05 significance

Gain:

Reading:	Mean Gain	Sd	n		
Study	-1.44	12.35	25	t=	-.5493367
				t-Table=	1.679
Control	1.04	18.55	23	Sig:	no

Written:	Mean Gain	Sd	n		
Study	-2.80	16.83	25	t=	.1295596
				t-Table=	1.679
Control	-3.43	16.83	23	Sig:	no

All Tests:	Mean Gain	Sd	n		
Study	-2.12	10.45	25	t=	-.3278361
				t-Table=	1.679
Control	-1.16	9.78	23	Sig:	no

Table 15 - Grade 4 S.S.A.S. Results for Reading (Literature)

```
                    Reading      T-Tests for Grade  4 S.S.A.S. Results
                                 t-Table values represtent .05 significance


   Pretest:                                               Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                      Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                                  ¦------¦------¦-----¦
   Treatment¦ 24.83¦ 10.83¦   18¦      t=  -2.015         Treatment¦ 23.42¦ 10.23¦   19¦      t=   -.098
            ¦------¦------¦-----¦ t-Table=  1.691                  ¦------¦------¦-----¦ t-Table=  1.688
   Control  ¦ 90.94¦  6.91¦   18¦   Sig.:     yes         Control  ¦ 23.73¦  9.17¦   19¦   Sig.:      no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                      Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                                  ¦------¦------¦-----¦
   Treatment¦ 28.44¦  9.87¦   18¦      t=  -1.994         Treatment¦ 28.68¦  9.52¦   19¦      t=    .035
            ¦------¦------¦-----¦ t-Table=  1.691                  ¦------¦------¦-----¦ t-Table=  1.688
   Control  ¦ 33.72¦  5.46¦   18¦   Sig.:     yes         Control  ¦ 28.57¦  9.79¦   19¦   Sig.:      no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                      Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                                  ¦------¦------¦-----¦
   Treatment¦ 27.17¦  7.39¦   18¦      t=   -.386         Treatment¦    27¦  8.13¦   19¦      t=   1.034
            ¦------¦------¦-----¦ t-Table=  1.691                  ¦------¦------¦-----¦ t-Table=  1.688
   Control  ¦ 28.67¦  4.78¦   18¦   Sig.:      no         Control  ¦ 24.32¦  7.85¦   19¦   Sig.:      no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                      All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                                  ¦------¦------¦-----¦
   Treatment¦ 80.44¦ 25.05¦   18¦      t=  -1.899         Treatment¦ 79.11¦ 21.67¦   19¦      t=    .330
            ¦------¦------¦-----¦ t-Table=  1.691                  ¦------¦------¦-----¦ t-Table=  1.688
   Control  ¦ 93.33¦ 14.22¦   18¦   Sig.:     yes         Control  ¦ 76.63¦ 24.54¦   19¦   Sig.:      no
```

Table 16 - Grade 4 S.S.A.S. Results for Language (Composition)

```
                  Language    T-Tests for Grade  4 S.S.A.S. Results
                              t-Table values represtent .05 significance


  Pretest:                                       Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
  Treatment¦ 28.11¦  8.34¦   18¦       t=    .472   Treatment¦ 26.42¦ 10.22¦   19¦       t=    .559
            ¦------¦------¦-----¦ t-Table=  1.691            ¦------¦------¦-----¦ t-Table=  1.688
  Control   ¦ 26.89¦  7.11¦   18¦    Sig.:     no   Control   ¦ 24.57¦ 10.17¦   19¦    Sig.:     no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
  Treatment¦ 29.78¦  7.94¦   18¦       t= -1.234   Treatment¦ 28.73¦  7.82¦   19¦       t=   -.076
            ¦------¦------¦-----¦ t-Table=  1.691            ¦------¦------¦-----¦ t-Table=  1.688
  Control   ¦ 32.61¦  5.62¦   18¦    Sig.:     no   Control   ¦ 28.94¦   9.1¦   19¦    Sig.:     no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
  Treatment¦ 27.17¦  6.34¦   18¦       t=  -.735   Treatment¦ 27.89¦  6.88¦   19¦       t=    .795
            ¦------¦------¦-----¦ t-Table=  1.691            ¦------¦------¦-----¦ t-Table=  1.688
  Control   ¦ 28.67¦  5.89¦   18¦    Sig.:     no   Control   ¦ 25.95¦  8.11¦   19¦    Sig.:     no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
  Treatment¦ 87.33¦ 18.86¦   18¦       t=  -.068   Treatment¦ 83.05¦ 21.22¦   19¦       t=    .487
            ¦------¦------¦-----¦ t-Table=  1.691            ¦------¦------¦-----¦ t-Table=  1.688
  Control   ¦ 87.72¦  15.5¦   18¦    Sig.:     no   Control   ¦ 79.47¦    24¦   19¦    Sig.:     no
```

Table 17 - Grade 4 S.S.A.S. Results for Spelling

```
                 Spelling    T-Tests for Grade  4 S.S.A.S. Results
                             t-Table values representent .05 significance


  Pretest:                                          Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                 Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 28.83¦ 10.26¦   18¦       t=   -.282   Treatment¦ 28.47¦ 11.86¦   19¦       t=    .173
            ¦------¦------¦-----¦ t-Table=  1.691             ¦------¦------¦-----¦ t-Table=  1.688
  Control   ¦ 29.67¦  7.35¦   18¦    Sig.:     no   Control   ¦ 27.79¦ 12.32¦   19¦    Sig.:     no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                 Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 31.94¦  7.37¦   18¦       t=   -.714   Treatment¦ 29.63¦ 10.66¦   19¦       t=   -.465
            ¦------¦------¦-----¦ t-Table=  1.691             ¦------¦------¦-----¦ t-Table=  1.688
  Control   ¦ 33.44¦  5.02¦   18¦    Sig.:     no   Control   ¦ 31.16¦  9.61¦   19¦    Sig.:     no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                 Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 27.11¦  7.17¦   18¦       t=   1.036   Treatment¦ 27.63¦  8.05¦   19¦       t=    .037
            ¦------¦------¦-----¦ t-Table=  1.691             ¦------¦------¦-----¦ t-Table=  1.688
  Control   ¦ 24.67¦  6.96¦   18¦    Sig.:     no   Control   ¦ 27.53¦   8.6¦   19¦    Sig.:     no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                 All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 87.89¦ 21.62¦   18¦       t=    .017   Treatment¦ 85.74¦ 28.12¦   19¦       t=   -.081
            ¦------¦------¦-----¦ t-Table=  1.691             ¦------¦------¦-----¦ t-Table=  1.688
  Control   ¦ 87.78¦ 17.33¦   18¦    Sig.:     no   Control   ¦ 86.47¦ 27.23¦   19¦    Sig.:     no
```

Table 18 - Grade 4 S.S.A.S. Results for All Subjects

```
        All Subjects       T-Tests for Grade  4 S.S.A.S. Results
                           t-Table values representent .05 significance

   Pretest:                                          Posttest:

Evaluation: | Mean |  Sd  | n*  |                  Evaluation: | Mean |  Sd  | n*  |
            |------|------|-----|                              |------|------|-----|
   Treatment| 27.26|  9.84|   54|       t=  -1.152     Treatment| 26.11| 10.81|   57|       t=    .369
            |------|------|-----| t-Table=   1.660              |------|------|-----| t-Table=   1.661
   Control  | 29.17|  7.19|   54|    Sig.:      no     Control  | 25.37| 10.59|   57|    Sig.:      no


Usefulness: | Mean |  Sd  | n*  |                  Usefulness: | Mean |  Sd  | n*  |
            |------|------|-----|                              |------|------|-----|
   Treatment| 30.06|  8.43|   54|       t=  -2.363     Treatment| 29.02|  9.24|   57|       t=   -.309
            |------|------|-----| t-Table=   1.660              |------|------|-----| t-Table=   1.661
   Control  | 33.26|  5.29|   54|    Sig.:     yes     Control  | 29.56|  9.41|   57|    Sig.:      no


Difficulty: | Mean |  Sd  | n*  |                  Difficulty: | Mean |  Sd  | n*  |
            |------|------|-----|                              |------|------|-----|
   Treatment| 27.91|  6.94|   54|       t=    .573     Treatment| 27.51|  7.58|   57|       t=   1.072
            |------|------|-----| t-Table=   1.660              |------|------|-----| t-Table=   1.661
   Control  | 27.19|   6.1|   54|    Sig.:      no     Control  | 25.93|  8.15|   57|    Sig.:      no


All Tests:  | Mean |  Sd  | n*  |                  All Tests:  | Mean |  Sd  | n*  |
            |------|------|-----|                              |------|------|-----|
   Treatment| 85.22| 21.84|   54|       t=  -1.200     Treatment| 82.63| 23.61|   57|       t=    .387
            |------|------|-----| t-Table=   1.660              |------|------|-----| t-Table=   1.661
   Control  | 89.61| 15.66|   54|    Sig.:      no     Control  | 80.86| 25.19|   57|    Sig.:      no


                    * 3 responses per participant - participants = n/3
```

Table 19 - Grade 5 S.S.A.S. Results for Reading (Literature)

```
                 Reading     T-Tests for Grade  5 S.S.A.S. Results
                             t-Table values representent .05 significance


   Pretest:                                        Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                  Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
   Treatment¦ 28.41¦  7.95¦   17¦      t=    .019     Treatment¦ 22.52¦  8.53¦   17¦      t=  -1.069
            ¦------¦------¦-----¦ t-Table=  1.690              ¦------¦------¦-----¦ t-Table=  1.690
   Control  ¦ 28.35¦ 10.43¦   20¦   Sig.:      no     Control  ¦  25.3¦  7.29¦   20¦   Sig.:      no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                  Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
   Treatment¦ 34.35¦  5.52¦   17¦      t=   1.060     Treatment¦    29¦  8.74¦   17¦      t=  -1.269
            ¦------¦------¦-----¦ t-Table=  1.690              ¦------¦------¦-----¦ t-Table=  1.690
   Control  ¦ 32.45¦  5.36¦   20¦   Sig.:      no     Control  ¦  32.3¦  7.08¦   20¦   Sig.:      no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                  Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
   Treatment¦ 28.35¦  5.74¦   17¦      t=   -.215     Treatment¦ 25.82¦  7.36¦   17¦      t=    .179
            ¦------¦------¦-----¦ t-Table=  1.690              ¦------¦------¦-----¦ t-Table=  1.690
   Control  ¦ 28.85¦  7.99¦   20¦   Sig.:      no     Control  ¦ 25.45¦  5.17¦   20¦   Sig.:      no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                  All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
   Treatment¦ 91.12¦ 16.49¦   17¦      t=    .230     Treatment¦ 77.35¦ 21.53¦   17¦      t=   -.939
            ¦------¦------¦-----¦ t-Table=  1.690              ¦------¦------¦-----¦ t-Table=  1.690
   Control  ¦ 89.65¦ 21.46¦   20¦   Sig.:      no     Control  ¦ 83.05¦ 15.28¦   20¦   Sig.:      no
```

Table 20 - Grade 5 S.S.A.S. Results for Language (Composition)

```
                    Language    T-Tests for Grade  5 S.S.A.S. Results
                                t-Table values representent .05 significance


  Pretest:                                        Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                 Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 25.94¦  9.18¦   17¦      t=    .583    Treatment¦ 29.59¦  6.47¦   17¦      t=    .486
            ¦------¦------¦-----¦ t-Table=  1.690             ¦------¦------¦-----¦ t-Table=  1.690
  Control   ¦  24.2¦  8.92¦   20¦   Sig.:     no    Control   ¦  28.4¦  8.14¦   20¦   Sig.:     no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                 Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 32.41¦  4.94¦   17¦      t=   -.882    Treatment¦ 33.84¦  5.52¦   17¦      t=   -.124
            ¦------¦------¦-----¦ t-Table=  1.690             ¦------¦------¦-----¦ t-Table=  1.690
  Control   ¦ 33.85¦  4.96¦   20¦   Sig.:     no    Control   ¦  34.1¦  6.96¦   20¦   Sig.:     no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                 Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 30.06¦  4.68¦   17¦      t=   1.206    Treatment¦ 30.82¦  4.42¦   17¦      t=   1.199
            ¦------¦------¦-----¦ t-Table=  1.690             ¦------¦------¦-----¦ t-Table=  1.690
  Control   ¦ 28.15¦   4.9¦   20¦   Sig.:     no    Control   ¦ 28.45¦  7.05¦   20¦   Sig.:     no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                 All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 88.41¦ 14.12¦   17¦      t=    .463    Treatment¦ 93.94¦ 12.11¦   17¦      t=    .637
            ¦------¦------¦-----¦ t-Table=  1.690             ¦------¦------¦-----¦ t-Table=  1.690
  Control   ¦  86.2¦ 14.73¦   20¦   Sig.:     no    Control   ¦ 90.95¦ 15.81¦   20¦   Sig.:     no
```

Table 21 - Grade 5 S.S.A.S. Results for Spelling

```
          Spelling     T-Tests for Grade  5 S.S.A.S. Results
                       t-Table values representent .05 significance


   Pretest:                                         Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                   Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                               ¦------¦------¦-----¦
   Treatment¦ 28.24¦  6.64¦   17¦      t=   -.139      Treatment¦ 24.53¦  10.1¦   17¦      t=   -.676
            ¦------¦------¦-----¦ t-Table=  1.690               ¦------¦------¦-----¦ t-Table=  1.690
   Control  ¦ 28.55¦  6.89¦   20¦   Sig.:      no      Control  ¦ 26.55¦  8.07¦   20¦   Sig.:      no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                   Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                               ¦------¦------¦-----¦
   Treatment¦ 35.29¦  4.48¦   17¦      t=   1.293      Treatment¦ 33.53¦  6.67¦   17¦      t=    .166
            ¦------¦------¦-----¦ t-Table=  1.690               ¦------¦------¦-----¦ t-Table=  1.690
   Control  ¦  32.9¦   6.4¦   20¦   Sig.:      no      Control  ¦ 33.15¦  7.13¦   20¦   Sig.:      no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                   Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                               ¦------¦------¦-----¦
   Treatment¦ 29.35¦  5.12¦   17¦      t=   1.065      Treatment¦ 28.47¦  6.27¦   17¦      t=   1.362
            ¦------¦------¦-----¦ t-Table=  1.690               ¦------¦------¦-----¦ t-Table=  1.690
   Control  ¦ 27.45¦  5.64¦   20¦   Sig.:      no      Control  ¦ 25.25¦  7.84¦   20¦   Sig.:      no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                   All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                               ¦------¦------¦-----¦
   Treatment¦ 92.88¦ 11.95¦   17¦      t=    .839      Treatment¦ 86.53¦ 19.04¦   17¦      t=    .250
            ¦------¦------¦-----¦ t-Table=  1.690               ¦------¦------¦-----¦ t-Table=  1.690
   Control  ¦  88.9¦ 16.15¦   20¦   Sig.:      no      Control  ¦ 84.95¦ 19.24¦   20¦   Sig.:      no
```

Table 22 - Grade 5 S.S.A.S. Results for All Subjects

```
      All Subjects       T-Tests for Grade  5 S.S.A.S. Results
                         t-Table values representt .05 significance


   Pretest:                                       Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦ n*  ¦                 Evaluation: ¦ Mean ¦  Sd  ¦ n*  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
   Treatment¦ 27.53¦  7.91¦   51¦       t=   .309    Treatment¦ 25.55¦  8.85¦   51¦       t=  -.759
            ¦------¦------¦-----¦ t-Table=  1.660             ¦------¦------¦-----¦ t-Table=  1.660
   Control  ¦ 27.03¦  8.95¦   60¦    Sig.:     no    Control  ¦ 26.75¦  7.81¦   60¦    Sig.:     no


Usefulness: ¦ Mean ¦  Sd  ¦ n*  ¦                 Usefulness: ¦ Mean ¦  Sd  ¦ n*  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
   Treatment¦ 34.02¦  5.05¦   51¦       t=   .937    Treatment¦ 32.02¦  7.29¦   51¦       t=  -.855
            ¦------¦------¦-----¦ t-Table=  1.660             ¦------¦------¦-----¦ t-Table=  1.660
   Control  ¦ 33.07¦  5.54¦   60¦    Sig.:     no    Control  ¦ 33.18¦  6.98¦   60¦    Sig.:     no


Difficulty: ¦ Mean ¦  Sd  ¦ n*  ¦                 Difficulty: ¦ Mean ¦  Sd  ¦ n*  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
   Treatment¦ 29.25¦  5.15¦   51¦       t=  1.002    Treatment¦ 28.37¦  6.36¦   51¦       t=  1.580
            ¦------¦------¦-----¦ t-Table=  1.660             ¦------¦------¦-----¦ t-Table=  1.660
   Control  ¦ 28.15¦  6.24¦   60¦    Sig.:     no    Control  ¦ 26.38¦  6.82¦   60¦    Sig.:     no


All Tests:  ¦ Mean ¦  Sd  ¦ n*  ¦                 All Tests:  ¦ Mean ¦  Sd  ¦ n*  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
   Treatment¦  90.8¦ 14.14¦   51¦       t=   .836    Treatment¦ 85.94¦ 18.93¦   51¦       t=  -.112
            ¦------¦------¦-----¦ t-Table=  1.660             ¦------¦------¦-----¦ t-Table=  1.660
   Control  ¦ 88.25¦ 17.45¦   60¦    Sig.:     no    Control  ¦ 86.32¦ 16.93¦   60¦    Sig.:     no


                    * 3 responses per participant - participants = n/3
```

Table 23 - Grade 6 S.S.A.S. Results for Reading (Literature)

```
                    Reading     T-Tests for Grade  6 S.S.A.S. Results
                                t-Table values representt .05 significance


  Pretest:                                         Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                 Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 29.05¦  8.69¦   21¦       t=   .581     Treatment¦  27.5¦  6.89¦   20¦       t=   2.013
            ¦------¦------¦-----¦ t-Table=  1.682             ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦ 27.39¦ 10.13¦   23¦    Sig.:     no     Control   ¦ 22.71¦  8.25¦   21¦    Sig.:     yes


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                 Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 33.67¦  6.63¦   21¦       t=  -.216     Treatment¦  33.5¦  6.52¦   20¦       t=    .614
            ¦------¦------¦-----¦ t-Table=  1.682             ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦ 34.04¦  4.66¦   23¦    Sig.:     no     Control   ¦  32.2¦  7.01¦   21¦    Sig.:      no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                 Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 30.57¦  4.77¦   21¦       t=   .491     Treatment¦  30.1¦  6.16¦   20¦       t=   1.189
            ¦------¦------¦-----¦ t-Table=  1.682             ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦ 29.57¦  8.13¦   23¦    Sig.:     no     Control   ¦ 27.43¦  8.04¦   21¦    Sig.:      no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                 All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 93.29¦  16.7¦   21¦       t=   .411     Treatment¦  91.1¦ 14.74¦   20¦       t=   1.616
            ¦------¦------¦-----¦ t-Table=  1.682             ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦    91¦ 19.94¦   23¦    Sig.:     no     Control   ¦ 82.33¦ 19.55¦   21¦    Sig.:      no
```

Table 24 - Grade 6 S.S.A.S. Results for Language (Composition)

Language T-Tests for Grade 6 S.S.A.S. Results
t-Table values represtent .05 significance

Pretest:

Evaluation:	Mean	Sd	n		
Treatment	29	5.73	21	t=	2.863
				t-Table=	1.682
Control	22.65	8.56	23	Sig.:	yes

Usefulness:	Mean	Sd	n		
Treatment	35.76	4.13	21	t=	2.183
				t-Table=	1.682
Control	31.91	7.05	23	Sig.:	yes

Difficulty:	Mean	Sd	n		
Treatment	30.81	3.94	21	t=	1.148
				t-Table=	1.682
Control	28.96	6.35	23	Sig.:	no

All Tests:	Mean	Sd	n		
Treatment	95.57	10.84	21	t=	2.688
				t-Table=	1.682
Control	83.52	17.73	23	Sig.:	yes

Posttest:

Evaluation:	Mean	Sd	n		
Treatment	26.6	6.56	20	t=	.508
				t-Table=	1.685
Control	25.33	9.16	21	Sig.:	no

Usefulness:	Mean	Sd	n		
Treatment	35.6	4.38	20	t=	1.213
				t-Table=	1.685
Control	33	8.58	21	Sig.:	no

Difficulty:	Mean	Sd	n		
Treatment	29.85	4.79	20	t=	.739
				t-Table=	1.685
Control	28.48	6.85	21	Sig.:	no

All Tests:	Mean	Sd	n		
Treatment	92.05	10.67	20	t=	1.102
				t-Table=	1.685
Control	86.81	18.53	21	Sig.:	no

Table 25 - Grade 6 S.S.A.S. Results for Spelling

```
          Spelling     T-Tests for Grade  6 S.S.A.S. Results
                       t-Table values represtent .05 significance


   Pretest:                                       Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
   Treatment¦ 27.38¦   7.3¦   21¦       t=   -.292    Treatment¦ 24.15¦  8.12¦   20¦       t=   -.394
            ¦------¦------¦-----¦ t-Table=   1.682             ¦------¦------¦-----¦ t-Table=   1.685
   Control  ¦    28¦   6.8¦   23¦    Sig.:      no    Control  ¦ 25.24¦  9.49¦   21¦    Sig.:      no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
   Treatment¦  35.5¦  3.75¦   21¦       t=    .187    Treatment¦ 33.15¦  7.18¦   20¦       t=    .039
            ¦------¦------¦-----¦ t-Table=   1.682             ¦------¦------¦-----¦ t-Table=   1.685
   Control  ¦  35.3¦  3.35¦   23¦    Sig.:      no    Control  ¦ 33.05¦  9.06¦   21¦    Sig.:      no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
   Treatment¦  30.9¦  4.15¦   21¦       t=    .636    Treatment¦ 29.35¦  6.38¦   20¦       t=   1.676
            ¦------¦------¦-----¦ t-Table=   1.682             ¦------¦------¦-----¦ t-Table=   1.685
   Control  ¦ 29.91¦  5.92¦   23¦    Sig.:      no    Control  ¦ 25.29¦  8.86¦   21¦    Sig.:      no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
   Treatment¦ 93.81¦ 13.02¦   21¦       t=    .150    Treatment¦ 86.65¦ 15.31¦   20¦       t=    .488
            ¦------¦------¦-----¦ t-Table=   1.682             ¦------¦------¦-----¦ t-Table=   1.685
   Control  ¦ 93.22¦ 13.12¦   23¦    Sig.:      no    Control  ¦ 83.57¦ 23.93¦   21¦    Sig.:      no
```

Table 26 - Grade 6 S.S.A.S. Results for All Subjects

All Subjects T-Tests for Grade 6 S.S.A.S. Results
t-Table values represtent .05 significance

Pretest:

Evaluation:	Mean	Sd	n*		
Treatment	28.48	7.26	63	t=	1.748
				t-Table=	1.658
Control	26.01	8.81	69	Sig.:	yes

Usefulness:	Mean	Sd	n*		
Treatment	34.98	5.01	63	t=	1.358
				t-Table=	1.658
Control	33.75	5.36	69	Sig.:	no

Difficulty:	Mean	Sd	n*		
Treatment	30.76	4.23	63	t=	1.287
				t-Table=	1.658
Control	29.48	6.78	69	Sig.:	no

All Tests:	Mean	Sd	n*		
Treatment	94.22	13.55	63	t=	1.817
				t-Table=	1.658
Control	89.25	17.42	69	Sig.:	yes

Posttest:

Evaluation:	Mean	Sd	n*		
Treatment	26.08	7.24	60	t=	1.123
				t-Table=	1.658
Control	24.43	8.92	63	Sig.:	no

Usefulness:	Mean	Sd	n*		
Treatment	34.08	6.14	60	t=	1.019
				t-Table=	1.658
Control	32.75	8.14	63	Sig.:	no

Difficulty:	Mean	Sd	n*		
Treatment	29.77	5.73	60	t=	2.160
				t-Table=	1.658
Control	27.06	7.95	63	Sig.:	yes

All Tests:	Mean	Sd	n*		
Treatment	89.93	13.7	60	t=	1.798
				t-Table=	1.658
Control	84.24	20.55	63	Sig.:	yes

* 3 responses per participant - participants = n/3

Table 27 - Grade 7 S.S.A.S. Results for Reading (Literature)

```
                Reading     T-Tests for Grade  7 S.S.A.S. Results
                            t- Table values represent .05 significance


  Pretest:                                     Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦             Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                         ¦------¦------¦-----¦
  Treatment¦ 24.39¦  7.74¦   23¦      t=   -.591   Treatment¦ 17.54¦   6.7¦   24¦      t=   -.240
            ¦------¦------¦-----¦ t-Table=  1.682             ¦------¦------¦-----¦ t-Table=  1.678
  Control   ¦ 25.73¦  7.45¦   22¦   Sig.:     no   Control   ¦ 18.08¦  8.86¦   25¦   Sig.:     no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦             Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                         ¦------¦------¦-----¦
  Treatment¦  31.7¦  5.08¦   23¦      t=   -.172   Treatment¦ 27.63¦  8.39¦   24¦      t=    .912
            ¦------¦------¦-----¦ t-Table=  1.682             ¦------¦------¦-----¦ t-Table=  1.678
  Control   ¦    32¦  6.58¦   22¦   Sig.:     no   Control   ¦  25.2¦ 10.13¦   25¦   Sig.:     no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦             Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                         ¦------¦------¦-----¦
  Treatment¦ 26.78¦  5.74¦   23¦      t=   -.984   Treatment¦ 26.88¦  5.98¦   24¦      t=   1.701
            ¦------¦------¦-----¦ t-Table=  1.682             ¦------¦------¦-----¦ t-Table=  1.678
  Control   ¦ 28.59¦  6.59¦   22¦   Sig.:     no   Control   ¦  23.2¦  8.83¦   25¦   Sig.:    yes


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦             All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                         ¦------¦------¦-----¦
  Treatment¦ 82.87¦ 15.63¦   23¦      t=   -.743   Treatment¦ 72.04¦ 17.38¦   24¦      t=    .948
            ¦------¦------¦-----¦ t-Table=  1.682             ¦------¦------¦-----¦ t-Table=  1.678
  Control   ¦ 86.32¦ 15.49¦   22¦   Sig.:     no   Control   ¦ 66.48¦ 23.14¦   25¦   Sig.:     no
```

Table 28 - Grade 7 S.S.A.S. Results for Language (Composition)

```
                    Language    T-Tests for Grade  7 S.S.A.S. Results
                                t- Table values represent .05 significance


   Pretest:                                       Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
   Treatment¦ 22.78¦  5.34¦   23¦       t=   -.435   Treatment¦ 17.58¦  9.32¦   24¦        t=  -1.250
            ¦------¦------¦-----¦ t-Table=   1.681            ¦------¦------¦-----¦ t-Table=   1.679
   Control  ¦ 23.82¦ 10.09¦   22¦   Sig.:       no   Control  ¦ 21.42¦ 11.81¦   24¦   Sig.:        no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
   Treatment¦ 32.13¦  5.92¦   23¦       t=   -.815   Treatment¦ 29.71¦ 10.14¦   24¦        t=    .864
            ¦------¦------¦-----¦ t-Table=   1.681            ¦------¦------¦-----¦ t-Table=   1.679
   Control  ¦ 33.64¦  6.51¦   22¦   Sig.:       no   Control  ¦ 27.13¦ 10.55¦   24¦   Sig.:        no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
   Treatment¦ 25.96¦  5.75¦   23¦       t=    .005   Treatment¦ 24.71¦   6.6¦   24¦        t=    .722
            ¦------¦------¦-----¦ t-Table=   1.681            ¦------¦------¦-----¦ t-Table=   1.679
   Control  ¦ 25.95¦  7.67¦   22¦   Sig.:       no   Control  ¦ 23.25¦  7.39¦   24¦   Sig.:        no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                            ¦------¦------¦-----¦
   Treatment¦ 80.87¦ 13.25¦   23¦       t=   -.482   Treatment¦    72¦ 21.25¦   24¦        t=    .031
            ¦------¦------¦-----¦ t-Table=   1.681            ¦------¦------¦-----¦ t-Table=   1.679
   Control  ¦ 83.41¦ 21.35¦   22¦   Sig.:       no   Control  ¦ 71.79¦ 25.33¦   24¦   Sig.:        no
```

Table 29 - Grade 7 S.S.A.S. Results for Spelling

```
                 Spelling     T-Tests for Grade  7 S.S.A.S. Results
                              t- Table values represent .05 significance


   Pretest:                                          Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                  Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
  Treatment¦ 21.48¦  6.09¦   23¦       t=   -.246     Treatment¦ 19.13¦  9.61¦   24¦       t=   -.097
            ¦------¦------¦-----¦ t-Table=  1.681               ¦------¦------¦-----¦ t-Table=  1.677
  Control   ¦ 22.09¦ 10.11¦   22¦    Sig.:     no     Control   ¦ 19.42¦ 11.33¦   26¦    Sig.:     no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                  Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
  Treatment¦ 31.57¦   7.1¦   23¦       t=   -.370     Treatment¦ 27.75¦ 11.27¦   24¦       t=    .683
            ¦------¦------¦-----¦ t-Table=  1.681               ¦------¦------¦-----¦ t-Table=  1.677
  Control   ¦ 32.32¦  6.48¦   22¦    Sig.:     no     Control   ¦ 25.54¦ 11.58¦   26¦    Sig.:     no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                  Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
  Treatment¦ 24.43¦  6.16¦   23¦       t=    .055     Treatment¦ 26.92¦  6.61¦   24¦       t=   1.772
            ¦------¦------¦-----¦ t-Table=  1.681               ¦------¦------¦-----¦ t-Table=  1.677
  Control   ¦ 24.32¦  7.33¦   22¦    Sig.:     no     Control   ¦ 23.04¦  8.64¦   26¦    Sig.:    yes


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                  All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
  Treatment¦ 77.48¦  14.5¦   23¦       t=   -.237     Treatment¦ 73.79¦ 23.08¦   24¦       t=    .788
            ¦------¦------¦-----¦ t-Table=  1.681               ¦------¦------¦-----¦ t-Table=  1.677
  Control   ¦ 78.73¦ 20.54¦   22¦    Sig.:     no     Control   ¦    68¦ 28.32¦   26¦    Sig.:     no
```

Table 30 - Grade 7 S.S.A.S. Results for All Subjects

All Subjects

T-Tests for Grade 7 S.S.A.S. Results
t- Table values represent .05 significance

Pretest:

Evaluation:	Mean	S.D.	n*		
Treatment	22.88	6.49	69	t=	-.728
				t-Table=	1.645
Control	23.88	9.28	66	Sig.:	no

Usefulness:	Mean	S.D.	n*		
Treatment	31.8	6	69	t=	-.793
				t-Table=	1.645
Control	32.65	6.46	66	Sig.:	no

Difficulty:	Mean	S.D.	n*		
Treatment	25.72	5.88	69	t=	-.500
				t-Table=	1.645
Control	26.29	7.32	66	Sig.:	no

All Tests:	Mean	S.D.	n*		
Treatment	80.41	14.45	69	t=	-.825
				t-Table=	1.645
Control	82.82	19.26	66	Sig.:	no

Posttest:

Evaluation:	Mean	S.D.	n*		
Treatment	18.08	8.55	72	t=	-.956
				t-Table=	1.645
Control	19.61	10.68	75	Sig.:	no

Usefulness:	Mean	S.D.	n*		
Treatment	28.36	9.91	72	t=	1.429
				t-Table=	1.645
Control	25.93	10.67	75	Sig.:	no

Difficulty:	Mean	S.D.	n*		
Treatment	26.17	6.4	72	t=	2.472
				t-Table=	1.645
Control	23.16	8.21	75	Sig.:	yes

All Tests:	Mean	S.D.	n*		
Treatment	72.61	20.43	72	t=	1.022
				t-Table=	1.645
Control	68.71	25.47	75	Sig.:	no

* 3 responses per participant - participants = n/3

Table 31 - Grade 8 S.S.A.S. Results for Reading (Literature)

```
                  Reading     T-Tests for Grade  8 S.S.A.S. Results
                              t- Table values represent .05 significance


  Pretest:                                      Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦              Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                          ¦------¦------¦-----¦
  Treatment¦ 27.61¦  7.6¦   23¦      t=   1.011  Treatment¦  25.5¦  8.26¦   20¦      t=   2.075
            ¦------¦------¦-----¦ t-Table=  1.682              ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦ 25.24¦  7.95¦   21¦   Sig.:     no  Control   ¦ 19.76¦  9.38¦   21¦   Sig.:    yes


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦              Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                          ¦------¦------¦-----¦
  Treatment¦  33.3¦  6.15¦   23¦      t=    .937  Treatment¦  31.9¦  7.62¦   20¦      t=   1.770
            ¦------¦------¦-----¦ t-Table=  1.682              ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦ 31.24¦  8.36¦   21¦   Sig.:     no  Control   ¦ 27.38¦  8.67¦   21¦   Sig.:    yes


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦              Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                          ¦------¦------¦-----¦
  Treatment¦ 28.74¦  5.52¦   23¦      t=    .934  Treatment¦  27.3¦  6.15¦   20¦      t=   -.146
            ¦------¦------¦-----¦ t-Table=  1.682              ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦ 27.14¦  5.84¦   21¦   Sig.:     no  Control   ¦ 27.62¦  7.79¦   21¦   Sig.:     no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦              All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                          ¦------¦------¦-----¦
  Treatment¦ 89.65¦  15.6¦   23¦      t=   1.221  Treatment¦  84.7¦ 19.87¦   20¦      t=   1.720
            ¦------¦------¦-----¦ t-Table=  1.682              ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦ 83.62¦ 17.17¦   21¦   Sig.:     no  Control   ¦ 74.76¦ 17.08¦   21¦   Sig.:    yes
```

Table 32 - Grade 8 S.S.A.S. Results for Language (Composition)

```
                 Language    T-Tests for Grade  8 S.S.A.S. Results
                             t- Table values represent .05 significance


  Pretest:                                          Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                  Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
  Treatment¦ 26.65¦  6.27¦   23¦       t=   1.785     Treatment¦ 21.65¦  8.23¦   20¦       t=   -.403
            ¦------¦------¦-----¦ t-Table=  1.682              ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦ 22.14¦ 10.19¦   21¦   Sig.:     yes     Control  ¦ 22.81¦ 10.07¦   21¦   Sig.:      no


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                  Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
  Treatment¦ 33.22¦  6.19¦   23¦       t=   1.533     Treatment¦ 31.15¦  8.81¦   20¦       t=   1.133
            ¦------¦------¦-----¦ t-Table=  1.682              ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦  29.1¦ 11.15¦   21¦   Sig.:      no     Control  ¦  28.1¦  8.43¦   21¦   Sig.:      no


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                  Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
  Treatment¦ 24.52¦  4.54¦   23¦       t=   2.909     Treatment¦  22.3¦  7.49¦   20¦       t=    .246
            ¦------¦------¦-----¦ t-Table=  1.682              ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦ 19.86¦  6.04¦   21¦   Sig.:     yes     Control  ¦ 21.71¦  7.83¦   21¦   Sig.:      no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                  All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                              ¦------¦------¦-----¦
  Treatment¦ 84.39¦ 15.01¦   23¦       t=   2.155     Treatment¦  75.1¦ 20.32¦   20¦       t=    .360
            ¦------¦------¦-----¦ t-Table=  1.682              ¦------¦------¦-----¦ t-Table=  1.685
  Control   ¦  71.1¦ 25.08¦   21¦   Sig.:     yes     Control  ¦ 72.62¦ 23.59¦   21¦   Sig.:      no
```

Table 33 - Grade 8 S.S.A.S. Results for Spelling

```
Spelling     T-Tests for Grade  8 S.S.A.S. Results
             t- Table values represent .05 significance


Pretest:                                             Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                    Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                                ¦------¦------¦-----¦
   Treatment¦ 26.91¦  7.46¦   23¦       t=  1.313       Treatment¦  27.9¦  7.81¦   20¦       t=  2.329
            ¦------¦------¦-----¦ t-Table=  1.682                ¦------¦------¦-----¦ t-Table=  1.685
   Control  ¦ 23.29¦ 10.68¦   21¦    Sig.:     no       Control  ¦ 20.38¦ 12.26¦   21¦    Sig.:    yes


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                    Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                                ¦------¦------¦-----¦
   Treatment¦ 36.17¦  4.66¦   23¦       t=  1.667       Treatment¦ 34.45¦  5.72¦   20¦       t=  2.197
            ¦------¦------¦-----¦ t-Table=  1.682                ¦------¦------¦-----¦ t-Table=  1.685
   Control  ¦ 32.95¦  7.88¦   21¦    Sig.:     no       Control  ¦ 27.86¦ 12.19¦   21¦    Sig.:    yes


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                    Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                                ¦------¦------¦-----¦
   Treatment¦ 27.74¦  3.97¦   23¦       t=   .671       Treatment¦ 27.95¦  5.24¦   20¦       t=  2.318
            ¦------¦------¦-----¦ t-Table=  1.682                ¦------¦------¦-----¦ t-Table=  1.685
   Control  ¦ 26.57¦  7.27¦   21¦    Sig.:     no       Control  ¦ 23.05¦  7.95¦   21¦    Sig.:    yes


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                    All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                                ¦------¦------¦-----¦
   Treatment¦ 90.83¦ 11.15¦   23¦       t=  1.653       Treatment¦  90.3¦ 14.98¦   20¦       t=  2.706
            ¦------¦------¦-----¦ t-Table=  1.682                ¦------¦------¦-----¦ t-Table=  1.685
   Control  ¦ 82.81¦ 20.15¦   21¦    Sig.:     no       Control  ¦ 71.29¦  27.8¦   21¦    Sig.:    yes
```

Table 34 - Grade 8 S.S.A.S. Results for All Subjects

All Subjects

T-Tests for Grade 8 S.S.A.S. Results
t- Table values represent .05 significance

Pretest:						Posttest:					
Evaluation:	Mean	Sd	n*			Evaluation:	Mean	Sd	n*		
Treatment	27.06	7.04	69	t=	2.401	Treatment	25.02	8.38	60	t=	2.344
				t-Table=	1.645					t-Table=	1.658
Control	23.56	9.61	63	Sig.:	yes	Control	20.98	10.55	63	Sig.:	yes
Usefulness:	Mean	Sd	n*			Usefulness:	Mean	Sd	n*		
Treatment	34.23	5.79	69	t=	2.355	Treatment	32.5	7.5	60	t=	2.997
				t-Table=	1.645					t-Table=	1.658
Control	31.1	9.23	63	Sig.:	yes	Control	27.78	9.76	63	Sig.:	yes
Difficulty:	Mean	Sd	n*			Difficulty:	Mean	Sd	n*		
Treatment	27	4.99	69	t=	2.329	Treatment	25.85	6.75	60	t=	1.272
				t-Table=	1.645					t-Table=	1.658
Control	24.52	7.14	63	Sig.:	yes	Control	24.13	8.14	63	Sig.:	no
All Tests:	Mean	Sd	n*			All Tests:	Mean	Sd	n*		
Treatment	88.29	14.14	69	t=	2.903	Treatment	83.37	19.3	60	t=	2.737
				t-Table=	1.645					t-Table=	1.658
Control	79.17	21.5	63	Sig.:	yes	Control	72.89	22.91	63	Sig.:	yes

* 3 responses per participant - participants = n/3

Table 35 - Grade 9 S.S.A.S. Results for Reading (Literature)

Reading T-Tests for Grade 9 S.S.A.S. Results
t- Table values represent .05 significance

Pretest:

Evaluation:	Mean	Sd	n		
Treatment	24.87	9.3	23	t=	-1.638
				t-Table=	1.679
Control	28.8	7.27	25	Sig.:	no

Usefulness:	Mean	Sd	n		
Treatment	31.91	8.1	23	t=	-1.362
				t-Table=	1.679
Control	34.72	6.13	25	Sig.:	no

Difficulty:	Mean	Sd	n		
Treatment	28.48	5.72	23	t=	1.086
				t-Table=	1.679
Control	26.52	6.69	25	Sig.:	no

All Tests:	Mean	Sd	n		
Treatment	85.26	18.96	23	t=	-.932
				t-Table=	1.679
Control	90.04	16.56	25	Sig.:	no

Posttest:

Evaluation:	Mean	Sd	n		
Treatment	19.58	8.09	24	t=	-2.420
				t-Table=	1.679
Control	25.09	7.49	23	Sig.:	yes

Usefulness:	Mean	Sd	n		
Treatment	26.17	7.46	24	t=	-2.567
				t-Table=	1.679
Control	32	8.11	23	Sig.:	yes

Difficulty:	Mean	Sd	n		
Treatment	23.92	7.96	24	t=	-1.581
				t-Table=	1.679
Control	27.56	7.82	23	Sig.:	no

All Tests:	Mean	Sd	n		
Treatment	69.67	19.35	24	t=	-2.723
				t-Table=	1.679
Control	84.65	18.32	23	Sig.:	yes

Table 36 - Grade 9 S.S.A.S. Results for Language (Composition)

```
                    Language     T-Tests for Grade  9 S.S.A.S. Results
                                 t- Table values represent .05 significance


  Pretest:                                        Posttest:

Evaluation: ¦ Mean ¦   Sd  ¦  n  ¦                Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦ ------¦-----¦                            ¦------¦------¦-----¦
  Treatment¦ 22.13¦    8.1¦   23¦       t=   -.491  Treatment¦ 20.83¦   7.5¦   24¦       t=   -.529
            ¦------¦ ------¦-----¦ t-Table=  1.679            ¦------¦------¦-----¦ t-Table=  1.679
  Control   ¦ 23.32¦   8.63¦   25¦   Sig.:      no  Control   ¦ 22.09¦   8.8¦   23¦   Sig.:      no


Usefulness: ¦ Mean ¦   Sd  ¦  n  ¦                Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦ ------¦-----¦                            ¦------¦------¦-----¦
  Treatment¦ 30.52¦   7.83¦   23¦       t=   -.017  Treatment¦ 27.83¦  8.74¦   24¦       t=  -1.267
            ¦------¦ ------¦-----¦ t-Table=  1.679            ¦------¦------¦-----¦ t-Table=  1.679
  Control   ¦ 30.56¦   8.59¦   25¦   Sig.:      no  Control   ¦    31¦   8.4¦   23¦   Sig.:      no


Difficulty: ¦ Mean ¦   Sd  ¦  n  ¦                Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦ ------¦-----¦                            ¦------¦------¦-----¦
  Treatment¦ 20.22¦   5.58¦   23¦       t=   1.621  Treatment¦ 21.46¦   6.4¦   24¦       t=    .637
            ¦------¦ ------¦-----¦ t-Table=  1.679            ¦------¦------¦-----¦ t-Table=  1.679
  Control   ¦  17.4¦    6.4¦   25¦   Sig.:      no  Control   ¦ 20.26¦  6.51¦   23¦   Sig.:      no


All Tests:  ¦ Mean ¦   Sd  ¦  n  ¦                All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦ ------¦-----¦                            ¦------¦------¦-----¦
  Treatment¦ 72.87¦  17.72¦   23¦       t=    .303  Treatment¦ 70.13¦ 18.97¦   24¦       t=   -.582
            ¦------¦ ------¦-----¦ t-Table=  1.679            ¦------¦------¦-----¦ t-Table=  1.679
  Control   ¦ 71.28¦  18.53¦   25¦   Sig.:      no  Control   ¦ 73.35¦ 18.98¦   23¦   Sig.:      no
```

Table 37 - Grade 9 S.S.A.S. Results for Spelling

```
          Spelling     T-Tests for Grade  9 S.S.A.S. Results
                       t- Table values represent .05 significance


  Pretest:                                        Posttest:

Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦                 Evaluation: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 21.83¦  5.61¦   23¦      t=  -2.063    Treatment¦ 18.33¦  7.98¦   24¦      t=  -1.937
            ¦------¦------¦-----¦ t-Table=  1.679             ¦------¦------¦-----¦ t-Table=  1.680
  Control   ¦ 25.96¦  7.95¦   25¦   Sig.:     yes    Control   ¦ 22.32¦  5.68¦   22¦   Sig.:     yes


Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦                 Usefulness: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦    35¦  5.47¦   23¦      t=   -.486    Treatment¦ 27.92¦  7.62¦   24¦      t=  -2.352
            ¦------¦------¦-----¦ t-Table=  1.679             ¦------¦------¦-----¦ t-Table=  1.680
  Control   ¦ 35.88¦  6.91¦   25¦   Sig.:      no    Control   ¦ 32.91¦  6.68¦   22¦   Sig.:     yes


Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦                 Difficulty: ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 27.74¦  4.56¦   23¦      t=    .980    Treatment¦ 25.33¦  5.45¦   24¦      t=   -.088
            ¦------¦------¦-----¦ t-Table=  1.679             ¦------¦------¦-----¦ t-Table=  1.680
  Control   ¦ 26.08¦  6.84¦   25¦   Sig.:      no    Control   ¦  25.5¦  7.51¦   22¦   Sig.:      no


All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦                 All Tests:  ¦ Mean ¦  Sd  ¦  n  ¦
            ¦------¦------¦-----¦                             ¦------¦------¦-----¦
  Treatment¦ 84.57¦ 11.23¦   23¦      t=   -.770    Treatment¦ 71.58¦ 13.13¦   24¦      t=  -2.335
            ¦------¦------¦-----¦ t-Table=  1.679             ¦------¦------¦-----¦ t-Table=  1.680
  Control   ¦ 87.92¦ 17.86¦   25¦   Sig.:      no    Control   ¦ 80.73¦ 13.43¦   22¦   Sig.:     yes
```

Table 38 - Grade 9 S.S.A.S. Results for All Subjects

All Subjects

T-Tests for Grade 9 S.S.A.S. Results
t- Table values represent .05 significance

Pretest:

Evaluation:	Mean	Sd	n*		
Treatment	22.94	7.83	69	t=	-2.311
				t-Table=	1.645
Control	26.03	8.18	75	Sig.:	yes

Usefulness:	Mean	Sd	n*		
Treatment	32.48	7.37	69	t=	-.997
				t-Table=	1.645
Control	33.72	7.54	75	Sig.:	no

Difficulty:	Mean	Sd	n*		
Treatment	25.48	6.44	69	t=	1.795
				t-Table=	1.645
Control	23.33	7.8	75	Sig.:	yes

All Tests:	Mean	Sd	n*		
Treatment	80.9	17.07	69	t=	-.714
				t-Table=	1.645
Control	83.08	19.37	75	Sig.:	no

Posttest:

Evaluation:	Mean	Sd	n*		
Treatment	19.58	7.82	72	t=	-2.784
				t-Table=	1.645
Control	23.18	7.46	68	Sig.:	yes

Usefulness:	Mean	Sd	n*		
Treatment	27.31	7.89	72	t=	-3.526
				t-Table=	1.645
Control	31.96	7.7	68	Sig.:	yes

Difficulty:	Mean	Sd	n*		
Treatment	23.6	6.78	72	t=	-.672
				t-Table=	1.645
Control	24.43	7.83	68	Sig.:	no

All Tests:	Mean	Sd	n*		
Treatment	70.46	17.16	72	t=	-3.102
				t-Table=	1.645
Control	79.56	17.54	68	Sig.:	yes

* 3 responses per participant - participants = n/3

Table 39 - Grade 4 Individual C.T.B.S. Results

Grade 4 Treatment Class C.T.B.S. Results

	Vocab			Read			Spell			Capit			Punct			Usage			All		
STUD #	V1	V2	VD	R1	R2	RD	S1	S2	SD	C1	C2	CD	P1	P2	PD	U1	U2	UD	A1	A2	AD
1	2.8	3.7	.9	2.4	2.7	.3	2.2	4.0	1.8	2.8	3.3	.5	2.2	4.3	2.1	2.8	4.2	1.4	2.53	3.70	1.17
2	5.5	6.5	1.0	4.7	5.0	.3	5.8	7.1	1.3	4.7	6.1	1.4	4.7	6.5	1.8	5.6	5.9	.3	5.17	6.18	1.02
3	2.9	4.2	1.3	5.0	3.3	-1.7	3.9	5.2	1.3	3.1	2.0	-1.1	3.1	3.5	.4	2.4	3.6	1.2	3.40	3.63	.23
4	2.4	4.0	1.6	2.7	3.9	1.2	2.3	4.8	2.5	2.6	3.6	1.0	2.6	3.5	.9	2.0	2.9	.9	2.43	3.78	1.35
5	4.2	5.7	1.5	4.5	4.4	-.1	4.5	7.6	3.1	4.0	5.1	1.1	4.0	6.8	2.8	4.3	5.9	1.6	4.25	5.92	1.67
6	3.3	5.9	2.6	4.0	4.4	.4	3.6	5.5	1.9	3.9	6.1	2.2	3.9	5.7	1.8	2.6	5.7	3.1	3.55	5.55	2.00
7	3.2	3.6	.4	3.6	3.1	-.5	1.8	5.0	3.2	2.6	3.4	.8	2.6	3.3	.7	2.7	3.1	.4	2.75	3.58	.83
8	4.4	5.7	1.3	4.2	5.9	1.7	5.6	6.0	.4	5.0	5.7	.7	5.0	6.5	1.5	4.7	5.7	1.0	4.82	5.92	1.10
9	4.4	4.6	.2	4.5	5.2	.7	5.8	7.6	1.8	4.9	6.8	1.9	4.9	2.0	-2.9	5.3	5.4	.1	4.97	5.27	.30
10	4.7	6.2	1.5	5.3	6.1	.8	5.5	7.1	1.6	5.8	6.3	.5	5.8	6.8	1.0	3.8	6.1	2.3	5.15	6.43	1.28
11	3.7	5.9	2.2	1.8	5.3	3.5	5.2	6.2	1.0	4.0	5.7	1.7	4.0	6.3	2.3	4.7	6.1	1.4	3.90	5.92	2.02
12	4.4	4.7	.3	4.8	5.9	1.1	3.9	4.8	.9	3.0	4.9	1.9	3.0	5.4	2.4	4.5	4.6	.1	3.93	5.05	1.12
13	3.7	5.9	2.2	4.2	4.8	.6	4.3	6.8	2.5	4.9	5.1	.2	4.9	5.2	.3	3.8	5.7	1.9	4.30	5.58	1.28
14	4.4	5.9	1.5	4.4	5.4	1.0	4.7	6.0	1.3	4.5	6.3	1.8	4.5	6.6	2.1	5.1	5.9	.8	4.60	6.02	1.42
15	5.5	5.3	-.2	4.6	5.3	.7	4.7	6.2	1.5	5.6	4.5	-1.1	.8	6.1	5.3	4.3	4.6	.3	4.26	5.33	1.08
16	6.2	6.2	0.0	4.5	6.7	2.2	3.6	3.5	-.1	2.2	6.6	4.4	2.2	4.7	2.5	4.2	5.2	1.0	3.82	5.48	1.67
MEAN-)	4.1	5.2	1.1	4.1	4.8	.8	4.2	5.8	1.6	4.0	5.1	1.1	3.6	5.2	1.6	3.9	5.0	1.1	3.99	5.21	1.22
S.D.-)	1.0	.9	.8	.9	1.1	1.1	1.2	1.2	.9	1.1	1.3	1.3	1.3	1.4	1.6	1.1	1.0	.8	.85	.95	.49
Ex^2-)	287	455	31	280	394	29	309	568	54	272	444	46	239	466	81	265	423	30	266	449	28
Ex---)	65.7	84.0	18.3	65.2	77.4	12.2	67.4	93.4	26.0	63.6	81.5	17.9	58.2	83.2	25.0	62.8	80.6	17.8	63.8	83.3	19.5

Grade 4 Control Class C.T.B.S. Results

	Vocab			Read			Spell			Capit			Punct			Usage			All		
STUD #	V1	V2	VD	R1	R2	RD	S1	S2	SD	C1	C2	CD	P1	P2	PD	U1	U2	UD	A1	A2	AD
1	3.3	4.0	.7	3.2	3.8	.6	3.7	5.5	1.8	3.0	5.7	2.7	2.7	5.0	2.3	3.4	4.8	1.4	3.22	4.80	1.58
2	4.0	4.9	.9	2.8	4.7	1.9	2.9	5.8	2.9	1.8	3.4	1.6	2.5	2.8	.3	2.2	3.8	1.6	2.70	4.23	1.53
3	3.1	3.9	.8	3.3	3.8	.5	3.6	3.6	0.0	3.7	2.9	-.8	3.2	2.5	-.7	3.2	3.1	-.1	3.35	3.30	-.05
4	3.7	5.7	2.0	3.8	6.1	2.3	4.7	4.8	.1	4.7	4.2	-.5	4.3	5.2	.9	4.5	4.6	.1	4.28	5.10	.82
5	3.4	3.5	.1	3.5	2.6	-.9	2.7	3.5	.8	3.9	3.6	-.3	3.0	4.0	1.0	3.0	2.1	-.9	3.25	3.22	-.03
6	4.4	5.9	1.5	4.4	5.9	1.5	4.7	4.5	-.2	3.0	5.7	2.7	3.2	5.9	2.7	3.5	5.0	1.5	3.87	5.48	1.62
7	3.9	5.9	2.0	4.6	5.3	.7	4.5	6.5	2.0	4.0	4.7	.7	3.5	5.9	2.4	4.3	5.2	.9	4.13	5.58	1.45
8	4.7	6.2	1.5	4.7	5.3	.6	6.4	7.1	.7	4.3	5.4	1.1	4.0	6.6	2.6	4.9	5.9	1.0	4.83	6.08	1.25
9	3.7	6.0	2.3	3.2	4.6	1.4	3.9	6.2	2.3	3.3	6.1	2.8	2.7	5.4	2.7	2.2	4.2	2.0	3.17	5.42	2.25
10	3.7	5.1	1.4	4.2	4.6	.4	5.8	7.1	1.3	3.1	5.7	2.6	5.1	4.3	-.8	4.7	2.9	-1.8	4.43	4.95	.52
11	2.9	3.9	1.0	3.2	4.3	1.1	3.1	2.8	-.3	2.6	2.0	-.6	2.7	3.3	.6	4.2	4.0	-.2	3.12	3.38	.27
MEAN-)	3.7	5.0	1.3	3.7	4.6	.9	4.2	5.2	1.0	3.4	4.5	1.1	3.4	4.6	1.3	3.6	4.1	.5	3.67	4.69	1.02
S.D.-)	.5	1.0	.6	.6	1.0	.8	1.1	1.4	1.0	.8	1.3	1.4	.8	1.3	1.3	.9	1.1	1.1	.64	.96	.73
Ex^2-)	154	285	22.7	156	246	16.75	206	321	23.9	133	240.5	34.78	130	253	35.78	155	201	16.69	152	251	17.2
Ex---)	40.8	55	14.2	40.9	51	10.1	46	57.4	11.4	37.4	49.4	12	36.9	50.9	14	40.1	45.6	5.5	40.35	51.55	11.2

Table 40 - Grade 5 Individual C.T.B.S. Results

Grade 5 Treatment Class C.T.B.S. Results

	Vocab			Read			Spell			Capit			Punct			Usage			All		
STUD #	V1	V2	VD	R1	R2	RD	S1	S2	SD	C1	C2	CD	P1	P2	PD	U1	U2	UD	A1	A2	AD
1	6.4	6.8	.4	6.3	7.5	1.2	5.8	5.5	-.3	4.6	5.3	.7	5.0	7.0	2.0	6.7	6.9	.2	5.80	6.50	.70
2	5.4	7.2	1.8	5.5	6.1	.6	4.3	4.9	.6	3.6	6.2	2.6	4.4	6.2	1.8	4.4	7.2	2.8	4.60	6.30	1.70
3	5.1	6.2	1.1	5.2	5.5	.3	5.3	6.1	.8	5.1	7.3	2.2	4.2	7.6	3.4	5.9	6.9	1.0	5.13	6.60	1.47
4	6.4	7.9	1.5	6.0	7.5	1.5	4.3	7.1	2.8	3.6	7.5	3.9	5.9	7.6	1.7	3.8	8.3	4.5	5.00	7.65	2.65
5	4.8	6.2	1.4	5.4	6.0	.6	5.3	7.1	1.8	3.8	6.8	3.0	3.9	7.0	3.1	4.6	6.6	2.0	4.63	6.62	1.98
6	5.3	6.8	1.5	7.1	7.5	.4	7.1	7.6	.5	6.1	6.8	.7	5.9	7.4	1.5	6.4	7.2	.8	6.32	7.22	.90
7	5.6	6.0	.4	7.8	5.5	-2.3	4.1	5.9	1.8	4.8	5.0	.2	4.5	6.2	1.7	4.8	5.8	1.0	5.27	5.73	.47
8	5.1	5.8	.7	5.7	5.7	0.0	5.5	5.9	.4	6.4	6.5	.1	6.3	7.2	.9	5.7	6.9	1.2	5.78	6.33	.55
9	3.9	4.4	.5	4.2	5.1	.9	4.3	6.1	1.8	4.6	5.9	1.3	4.7	4.6	-.1	3.8	3.9	.1	4.25	5.00	.75
10	7.1	7.2	.1	6.3	7.9	1.6	7.1	8.2	1.1	7.0	8.2	1.2	7.9	8.6	.7	7.5	7.7	.2	7.15	7.97	.82
11	4.5	6.2	1.7	5.0	6.0	1.0	4.5	4.3	-.2	3.1	4.7	1.6	4.1	5.8	1.7	5.2	6.3	1.1	4.40	5.55	1.15
12	3.3	5.6	2.3	4.0	5.4	1.4	5.5	5.3	-.2	3.4	7.1	3.7	4.3	5.1	.8	3.2	5.5	2.3	3.95	5.67	1.72
13	4.5	6.2	1.7	5.7	6.6	.9	4.3	5.7	1.4	3.3	6.5	3.2	3.6	4.6	1.0	4.4	5.5	1.1	4.30	5.85	1.55
14	3.4	4.6	1.2	4.9	5.4	.5	4.0	4.3	.3	3.6	5.3	1.7	3.9	5.1	1.2	4.0	4.9	.9	3.97	4.93	.97
15	5.1	6.8	1.7	5.8	5.6	-.2	6.0	5.7	-.3	5.9	6.5	.6	5.4	4.9	-.5	5.2	5.8	.6	5.57	5.88	.32
16	4.4	5.6	1.2	4.7	5.7	1.0	3.4	4.9	1.5	3.9	6.8	2.9	5.9	7.0	1.1	4.8	5.3	.5	4.52	5.88	1.37
17	6.1	6.8	.7	5.5	5.8	.3	6.0	7.6	1.6	5.3	7.5	2.2	7.1	7.2	.1	5.2	6.6	1.4	5.87	6.92	1.05
MEAN-)	5.1	6.3	1.2	5.6	6.2	.6	5.1	6.0	.9	4.6	6.5	1.9	5.1	6.4	1.3	5.0	6.3	1.3	5.09	6.27	1.18
S.D.-)	1.0	.9	.6	.9	.9	.9	1.0	1.1	.9	1.2	.9	1.2	1.2	1.2	1.0	1.1	1.1	1.1	.87	.82	.59
Ex^2-)	457	678	29	547	659	18	462	636	27	382	725	83	469	724	45	452	697	47	453	680	30
Ex---)	86	106	20	95	105	10	87	102	15	78	110	32	87	109	22	86	107	22	86	107	20

Grade 5 Control Class C.T.B.S. Results

	Vocab			Read			Spell			Capit			Punct			Usage			All		
STUD #	V1	V2	VD	R1	R2	RD	S1	S2	SD	C1	C2	CD	P1	P2	PD	U1	U2	UD	A1	A2	AD
1	3.7	4.8	1.1	3.8	4.7	.9	5.0	5.5	.5	4.4	5.1	.7	5.2	6.2	1.0	4.0	4.9	.9	4.35	5.20	.85
2	5.9	6.5	.6	5.3	6.7	1.4	6.0	6.2	.2	5.1	7.1	2.0	4.5	7.1	2.6	6.1	6.2	.1	5.48	6.63	1.15
3	5.1	4.7	-.4	3.3	5.4	2.1	3.2	6.0	2.8	4.2	5.4	1.2	3.0	5.7	2.7	4.8	5.8	1.0	3.93	5.50	1.57
4	5.5	6.7	1.2	4.7	6.3	1.6	4.5	6.6	2.1	5.4	5.1	-.3	5.0	7.3	2.3	5.7	6.0	.3	5.13	6.33	1.20
5	5.9	7.0	1.1	6.8	7.2	.4	4.9	6.2	1.3	6.8	5.4	-1.4	5.7	7.7	2.0	5.7	5.6	-.1	5.97	6.52	.55
6	3.9	4.0	.1	4.3	4.4	.1	3.6	3.8	.2	4.2	3.2	-1.0	3.8	3.6	-.2	4.1	7.1	3.0	3.98	4.35	.37
7	5.7	6.5	.8	4.7	5.9	1.2	5.2	6.8	1.6	6.1	5.4	-.7	5.0	6.9	1.9	5.0	5.6	.6	5.28	6.18	.90
8	6.1	5.9	-.2	3.9	5.7	1.8	4.5	5.5	1.0	4.8	4.5	-.3	4.6	7.5	2.9	4.4	5.8	1.4	4.72	5.82	1.10
9	5.3	5.9	.6	5.0	5.0	0.0	6.8	6.4	-.4	4.2	5.4	1.2	3.3	6.9	3.6	4.6	6.0	1.4	4.87	5.93	1.07
10	4.3	4.9	.6	4.3	5.6	1.3	3.8	5.2	1.4	4.7	7.3	2.6	5.0	7.1	2.1	4.8	4.5	-.3	4.48	5.77	1.28
11	6.1	7.0	.9	4.5	6.9	2.4	6.4	7.3	.9	5.2	8.2	3.0	5.4	7.7	2.3	5.1	7.1	2.0	5.45	7.37	1.92
12	3.2	4.8	1.6	4.4	4.8	.4	5.5	6.2	.7	4.7	6.2	1.5	5.2	5.7	.5	3.8	6.0	2.2	4.47	5.62	1.15
13	5.1	6.4	1.3	5.9	6.9	1.0	5.8	7.0	1.2	5.9	5.9	0.0	5.2	6.9	1.7	5.7	6.8	1.1	5.60	6.65	1.05
14	4.4	5.9	1.5	3.8	4.6	.8	4.7	5.8	1.1	6.4	5.4	-1.0	4.3	6.0	1.7	3.9	6.9	3.0	4.58	5.76	1.18
15	4.7	5.8	1.1	5.3	6.2	.9	5.8	6.8	1.0	5.7	7.3	1.6	6.1	6.6	.5	5.7	6.8	1.1	5.55	6.58	1.03
16	3.9	6.1	2.2	4.9	7.4	2.5	6.4	7.3	.9	4.6	6.8	2.2	4.8	7.9	3.1	4.2	7.4	3.2	4.80	7.15	2.35
17	4.0	5.1	1.1	4.4	6.5	2.1	5.8	6.2	.4	4.5	4.8	.3	4.4	6.4	2.0	4.1	6.8	2.7	4.53	5.97	1.43
18	6.5	7.6	1.1	6.7	7.5	.8	7.6	8.7	1.1	6.8	8.2	1.4	7.9	8.2	.3	7.5	8.1	.6	7.17	8.05	.88
19	5.7	6.2	.5	5.4	6.8	1.4	7.6	7.3	-.3	5.4	7.3	1.9	5.4	7.1	1.7	4.8	5.8	1.0	5.72	6.75	1.03
20	4.7	7.3	2.6	5.8	6.0	.2	6.8	7.3	.5	4.9	6.5	1.6	5.0	7.1	2.1	5.0	4.9	-.1	5.37	6.52	1.15
MEAN-)	5.0	6.0	1.0	4.9	6.0	1.2	5.5	6.4	.9	5.2	6.0	.8	4.9	6.8	1.8	5.0	6.2	1.3	5.07	6.23	1.16
S.D.-)	.9	1.0	.7	.9	.9	.7	1.2	1.0	.7	.8	1.3	1.3	1.0	1.0	1.0	.9	.9	1.1	.74	.79	.42
Ex^2-)	514	727	29	489	744	38	633	840	27	554	758	46	508	939	86	506	786	54	525	789	30
Ex---)	100	119	19	97	120	23	110	128	18	104	120	16	99	136	37	99	124	25	101	125	23

Table 41 - Grade 6 Individual C.T.B.S. Results

Grade 6 Treatment Class C.T.B.S. Results

	Vocab			Read			Spell			Capit			Punct			Usage			All		
STUD #	V1	V2	VD	R1	R2	RD	S1	S2	SD	C1	C2	CD	P1	P2	PD	U1	U2	UD	A1	A2	AD
1	6.8	7.8	1.0	7.7	8.3	.6	5.9	7.4	1.5	7.1	8.5	1.4	7.0	7.4	.4	6.9	8.6	1.7	6.90	8.00	1.10
2	5.5	6.9	1.4	5.8	6.7	.9	3.7	6.5	2.8	3.4	6.5	3.1	5.1	5.8	.7	4.9	5.1	.2	4.73	6.25	1.52
3	6.5	7.3	.8	6.7	7.8	1.1	7.6	9.4	1.8	5.9	8.3	2.4	7.6	9.3	1.7	7.7	9.0	1.3	7.00	8.52	1.52
4	4.9	6.8	1.9	4.5	6.1	1.6	6.5	6.7	.2	4.7	7.3	2.6	5.1	7.0	1.9	5.0	6.4	1.4	5.12	6.72	1.60
5	6.3	8.2	1.9	6.7	7.7	1.0	7.1	9.2	2.1	6.5	9.7	3.2	7.6	9.6	2.0	6.3	9.0	2.7	6.75	8.90	2.15
6	2.8	5.2	2.4	3.0	5.7	2.7	4.5	6.7	2.2	3.6	6.2	2.6	4.0	5.8	1.8	3.3	6.4	3.1	3.53	6.00	2.47
7	5.2	6.3	1.1	6.6	7.1	.5	5.7	7.9	2.2	5.7	8.7	3.0	6.6	8.0	1.4	6.2	7.0	.8	6.00	7.50	1.50
8	4.9	6.3	1.4	6.4	6.7	.3	6.9	7.3	.4	6.2	6.5	.3	6.0	6.0	0.0	6.9	7.0	.1	6.22	6.63	.42
9	6.2	7.3	1.1	6.4	7.4	1.0	5.9	8.0	2.1	7.1	7.0	-.1	6.7	9.3	2.6	6.3	7.8	1.5	6.43	7.80	1.37
10	5.5	7.5	2.0	5.3	7.1	1.8	6.7	7.0	.3	6.5	8.6	2.1	6.2	7.7	1.5	6.6	7.2	.6	6.13	7.52	1.38
11	6.3	7.2	.9	6.0	7.2	1.2	6.9	8.2	1.3	7.3	7.6	.3	5.5	7.7	2.2	5.1	6.6	1.5	6.18	7.42	1.23
12	5.3	6.1	.8	5.3	7.1	1.8	6.9	7.4	.5	7.1	7.3	.2	7.6	8.3	.7	6.6	7.5	.9	6.47	7.28	.82
13	5.8	6.5	.7	6.2	6.9	.7	6.9	8.5	1.6	7.3	7.3	0.0	6.5	7.7	1.2	5.5	7.2	1.7	6.37	7.35	.98
14	7.3	8.7	1.4	7.7	8.2	.5	6.9	8.0	1.1	7.9	8.5	.6	6.5	9.0	2.5	7.2	7.8	.6	7.25	8.37	1.12
15	6.5	7.5	1.0	6.3	7.5	1.2	5.5	8.5	3.0	6.8	8.3	1.5	7.0	7.2	.2	6.3	7.8	1.5	6.40	7.80	1.40
16	6.0	7.3	1.3	6.4	7.6	1.2	5.5	7.7	2.2	7.3	8.3	1.0	7.0	7.2	.2	7.7	8.2	.5	6.65	7.72	1.07
17	6.6	8.0	1.4	4.7	7.0	2.3	4.8	6.1	1.3	5.0	4.7	-.3	3.9	6.3	2.4	6.0	7.0	1.0	5.17	6.52	1.35
18	6.6	7.6	1.0	6.9	8.7	1.8	7.4	8.2	.8	7.9	8.0	.1	7.0	9.3	2.3	6.9	7.5	.6	7.12	8.22	1.10
19	6.3	7.0	.7	6.0	8.1	2.1	6.3	8.0	1.7	6.2	8.5	2.3	7.6	8.0	.4	7.7	8.6	.9	6.68	8.03	1.35
20	7.0	8.2	1.2	8.1	8.3	.2	7.4	8.5	1.1	7.9	8.7	.8	7.9	8.7	.8	6.6	7.2	.6	7.48	8.27	.78
MEAN-)	5.9	7.2	1.3	6.1	7.4	1.2	6.2	7.8	1.5	6.4	7.7	1.4	6.4	7.8	1.3	6.3	7.4	1.2	6.23	7.54	1.31
S.D.-)	1.0	.8	.5	1.2	.7	.7	1.0	.9	.8	1.3	1.1	1.2	1.1	1.2	.8	1.1	.9	.7	.93	.77	.44
Ex^2-)	719	1046	36	779	1094	39	802	1219	58	845	1219	64	850	1233	50	813	1126	38	793	1149	38
Ex---)	118	144	25	123	147	24	125	155	30	127	154	27	128	155	27	126	149	23	125	151	26

Grade 6 Control Class C.T.B.S. Results

	Vocab			Read			Spell			Capit			Punct			Usage			All		
STUD #	V1	V2	VD	R1	R2	RD	S1	S2	SD	C1	C2	CD	P1	P2	PD	U1	U2	UD	A1	A2	AD
1	5.5	7.5	2.0	5.2	6.4	1.2	4.8	6.1	1.3	5.0	6.8	1.8	5.8	6.5	.7	5.8	7.5	1.7	5.35	6.80	1.45
2	5.7	7.5	1.8	4.2	6.4	2.2	5.5	6.1	.6	4.0	6.8	2.8	3.6	6.5	2.9	3.9	7.5	3.6	4.48	6.80	2.32
3	5.7	6.7	1.0	5.5	7.1	1.6	5.9	6.1	.2	5.3	5.7	.4	6.0	7.7	1.7	4.9	7.0	2.1	5.55	6.72	1.17
4	5.1	6.1	1.0	5.5	6.4	.9	7.6	8.2	.6	7.3	8.3	1.0	7.6	6.3	-1.3	4.6	6.6	2.0	6.28	6.98	.70
5	5.7	7.8	2.1	5.7	5.9	.2	5.7	7.4	1.7	5.0	7.3	2.3	3.3	6.0	2.7	2.6	7.5	4.9	4.67	6.98	2.32
6	5.7	7.8	2.1	5.6	7.6	2.0	7.1	8.8	1.7	7.7	7.8	.1	7.6	9.0	1.4	6.3	7.5	1.2	6.67	8.08	1.42
7	6.2	7.8	1.6	6.6	7.5	.9	4.1	6.8	2.7	4.2	3.9	-.3	5.8	6.5	.7	6.9	7.2	.3	5.63	6.62	.98
8	6.5	7.2	.7	6.4	7.7	1.3	5.9	6.8	.9	7.1	7.0	-.1	7.2	8.3	1.1	5.5	7.5	2.0	6.43	7.42	.98
9	6.5	7.3	.8	6.9	7.9	1.0	7.4	8.5	1.1	7.5	7.8	.3	7.2	9.0	1.8	7.2	9.0	1.8	7.12	8.25	1.13
10	4.9	5.8	.9	4.2	5.8	1.6	4.4	7.1	2.7	3.8	7.6	3.8	3.9	7.4	3.5	4.9	7.5	2.6	4.35	6.87	2.52
11	6.3	7.2	.9	6.4	6.7	.3	5.7	5.9	.2	6.5	7.6	1.1	5.8	7.2	1.4	6.9	6.6	-.3	6.27	6.87	.60
12	5.2	6.9	1.7	5.8	6.7	.9	6.3	7.7	1.4	7.7	7.8	.1	7.0	8.7	1.7	6.9	7.5	.6	6.48	7.55	1.07
13	5.6	5.8	.2	5.4	4.9	-.5	6.9	6.3	-.6	3.8	3.3	-.5	5.5	4.8	-.7	5.8	6.2	.4	5.50	5.22	-.28
14	7.2	8.4	1.2	7.7	8.1	.4	7.1	9.2	2.1	7.1	6.2	-.9	7.0	7.0	0.0	6.3	7.2	.9	7.07	7.68	.62
15	4.4	6.4	2.0	5.4	6.3	.9	5.7	6.8	1.1	6.2	7.8	1.6	5.3	7.0	1.7	4.9	7.5	2.6	5.32	6.97	1.65
16	5.4	6.6	1.2	6.6	7.3	.7	6.3	7.3	1.0	5.9	7.0	1.1	7.0	8.5	1.5	4.6	7.2	2.6	5.97	7.32	1.35
17	4.3	5.4	1.1	4.4	4.4	0.0	3.8	4.7	.9	5.9	7.3	1.4	4.9	5.1	.2	5.1	3.9	-1.2	4.73	5.13	.40
18	5.7	8.4	2.7	6.7	7.9	1.2	8.2	8.5	.3	7.5	7.3	-.2	7.2	7.4	.2	7.2	7.8	.6	7.08	7.88	.80
MEAN-)	5.6	7.0	1.4	5.8	6.7	.9	6.0	7.1	1.1	6.0	6.8	.9	6.0	7.2	1.2	5.6	7.2	1.6	5.83	7.01	1.18
S.D.-)	.7	.9	.6	.9	1.0	.7	1.2	1.2	.8	1.4	1.3	1.2	1.3	1.2	1.2	1.2	1.0	1.4	.88	.80	.69
Ex^2-)	583	904	42	619	832	24	679	939	35	676	875	40	676	949	50	586	937	81	626	895	34
Ex---)	102	127	25	104	121	17	108	128	20	108	123	16	108	129	21	100	129	28	105	126	21

Table 42 - Grade 7 Individual C.T.B.S. Treatment Group Results

Grade 7 Treatment Class C.T.B.S. Results

	Vocab			Read			Spell			Capit			Punct			Usage			All		
STUD #	V1	V2	VD	R1	R2	RD	S1	S2	SD	C1	C2	CD	P1	P2	PD	U1	U2	UD	A1	A2	AD
1	6.0	6.8	.8	6.5	7.9	1.4	7.0	7.0	0.0	6.6	7.3	.7	7.3	6.9	-.4	6.3	7.6	1.3	6.62	7.25	.63
2	8.4	8.7	.3	8.1	9.3	1.2	7.3	7.1	-.2	8.4	6.7	-1.7	8.1	7.3	-.8	7.1	8.5	1.4	7.90	7.93	.03
3	6.1	7.3	1.2	6.3	6.2	-.1	5.8	7.3	1.5	3.0	7.5	4.5	5.9	3.9	-2.0	5.7	6.6	.9	5.47	6.47	1.00
4	5.8	5.9	.1	6.1	5.3	-.8	4.8	7.1	2.3	4.2	4.5	.3	6.2	7.1	.9	6.9	7.3	.4	5.67	6.20	.53
5	6.3	7.4	1.1	6.6	7.5	.9	7.0	8.0	1.0	7.4	5.6	-1.8	5.0	7.8	2.8	6.5	7.1	.6	6.47	7.23	.77
6	7.8	8.7	.9	8.7	9.3	.6	9.2	10.0	.8	7.9	9.1	1.2	8.5	9.8	1.3	8.0	9.2	1.2	8.35	9.35	1.00
7	6.3	6.9	.6	6.2	7.8	1.6	5.0	6.2	1.2	7.6	8.0	.4	6.2	7.1	.9	6.1	8.0	1.9	6.23	7.33	1.10
8	6.3	6.9	.6	7.2	7.6	.4	7.6	7.8	.2	7.6	8.0	.4	6.6	7.3	.7	6.9	7.8	.9	7.03	7.57	.53
9	5.2	6.4	1.2	6.6	7.5	.9	5.8	5.2	-.6	6.6	6.7	.1	7.1	5.1	-2.0	4.2	4.8	.6	5.92	5.95	.03
10	7.6	9.4	1.8	7.9	8.2	.3	8.2	9.2	1.0	9.3	8.5	-.8	8.5	10.7	2.2	8.0	9.2	1.2	8.25	9.20	.95
11	7.6	8.0	.4	7.8	10.6	2.8	7.2	8.8	1.6	7.6	10.0	2.4	7.6	7.5	-.1	8.0	8.5	.5	7.63	8.90	1.27
12	5.0	5.7	.7	5.9	4.1	-1.8	4.4	4.8	.4	6.6	7.3	.7	6.4	5.1	-1.3	5.9	4.1	-1.8	5.70	5.18	-.52
13	5.6	6.6	1.0	5.6	6.3	.7	3.6	6.5	2.9	6.6	6.7	.1	6.2	6.9	.7	6.1	5.9	-.2	5.62	6.48	.87
14	8.8	9.4	.6	8.5	9.7	1.2	8.5	9.0	.5	9.0	9.5	.5	8.7	9.8	1.1	8.7	9.8	1.1	8.70	9.53	.83
15	6.1	7.3	1.2	7.4	7.4	0.0	6.3	6.5	.2	6.9	7.0	.1	7.6	7.5	-.1	7.1	8.9	1.8	6.90	7.43	.53
16	6.1	7.1	1.0	7.0	7.9	.9	6.6	7.3	.7	6.9	6.4	-.5	6.9	5.1	-1.8	4.7	4.8	.1	6.37	6.43	.07
17	6.5	7.8	1.3	6.9	7.1	.2	5.9	8.2	2.3	6.4	8.0	1.6	7.8	7.3	-.5	6.3	7.8	1.5	6.63	7.70	1.07
18	8.1	8.3	.2	7.5	9.1	1.6	6.3	8.4	2.1	7.9	7.5	-.4	7.1	8.0	.9	8.4	10.2	1.8	7.55	8.58	1.03
19	6.5	7.6	1.1	7.5	8.1	.6	6.1	7.0	.9	6.1	7.0	.9	5.9	7.1	1.2	5.9	8.0	2.1	6.33	7.47	1.13
20	4.8	6.1	1.3	7.2	3.7	-3.5	4.2	6.0	1.8	3.6	5.6	2.0	3.7	5.7	2.0	3.7	6.1	2.4	4.53	5.53	1.00
21	6.2	7.0	.8	6.6	6.3	-.3	5.8	7.3	1.5	4.8	7.5	2.7	6.9	7.8	.9	6.7	7.8	1.1	6.17	7.28	1.12
22	6.7	9.4	2.7	7.3	8.3	1.0	7.3	8.4	1.1	7.1	9.1	2.0	6.2	7.5	1.3	7.1	8.2	1.1	6.95	8.48	1.53
MEAN->	6.5	7.5	1.0	7.1	7.5	.4	6.4	7.4	1.1	6.7	7.4	.7	6.8	7.2	.4	6.6	7.6	1.0	6.68	7.43	.75
S.D.->	1.1	1.1	.6	.8	1.7	1.3	1.4	1.3	.9	1.6	1.3	1.4	1.2	1.6	1.3	1.3	1.6	.9	1.03	1.20	.48
Ex^2->	965	1259	27	1112	1301	39	932	1244	41	1052	1252	55	1058	1193	41	981	1311	39	1005	1247	17
Ex--->	144	165	21	155	165	10	140	163	23	148	164	15	150	158	8	144	166	22	147	164	17

Table 43 - Grade 7 Individual C.T.B.S. Control Group Results

Grade 7 Control Class C.T.B.S. Results

	Vocab			Read			Spell			Capit			Punct			Usage			All		
STUD #	V1	V2	VD	R1	R2	RD	S1	S2	SD	C1	C2	CD	P1	P2	PD	U1	U2	UD	A1	A2	AD
1	8.1	9.4	1.3	8.1	8.4	.3	5.8	7.5	1.7	6.1	5.8	-.3	5.9	6.9	1.0	7.1	8.0	.9	6.85	7.67	.82
2	6.7	8.0	1.3	6.4	7.1	.7	5.5	8.0	2.5	6.9	8.9	2.0	8.1	9.0	.9	6.9	8.9	2.0	6.75	8.32	1.57
3	5.3	5.7	.4	5.2	4.8	-.4	5.8	6.0	.2	6.6	5.3	-1.3	6.4	6.4	0.0	4.5	6.6	2.1	5.63	5.80	.17
4	7.8	9.2	1.4	8.2	9.4	1.2	7.3	8.8	1.5	8.6	7.8	-.8	8.7	9.5	.8	7.4	9.2	1.8	8.00	8.98	.98
5	8.1	9.7	1.6	9.3	9.1	-.2	8.9	10.3	1.4	7.9	9.7	1.8	8.5	8.7	.2	8.4	10.2	1.8	8.52	9.62	1.10
6	6.8	9.2	2.4	7.7	7.1	-.6	6.4	7.8	1.4	7.4	7.5	.1	6.9	7.1	.2	5.5	7.3	1.8	6.78	7.67	.88
7	7.1	8.7	1.6	7.4	8.0	.6	7.2	8.2	1.0	5.9	6.7	.8	6.2	6.6	.4	6.5	7.6	1.1	6.72	7.63	.92
8	5.5	7.4	1.9	5.7	5.9	.2	8.0	7.6	-.4	7.4	8.0	.6	8.1	7.8	-.3	5.9	7.0	1.1	6.77	7.28	.52
9	7.2	7.5	.3	7.0	8.2	1.2	5.8	6.4	.6	6.9	7.8	.9	7.6	6.9	-.7	5.7	8.5	2.8	6.70	7.55	.85
10	6.3	7.0	.7	6.3	6.2	-.1	6.4	6.4	0.0	7.4	6.7	-.7	5.2	6.9	1.7	7.4	8.2	.8	6.50	6.90	.40
11	7.6	8.9	1.3	7.6	9.3	1.7	7.0	8.1	1.1	7.0	8.0	1.0	5.1	8.7	3.6	6.8	9.5	2.7	6.85	8.75	1.90
12	7.6	8.1	.5	8.1	7.4	-.7	7.2	5.8	-1.4	7.1	5.6	-1.5	7.6	6.9	-.7	7.7	7.6	-.1	7.55	6.90	-.65
13	5.3	6.6	1.3	5.5	5.7	.2	4.4	4.3	-.1	5.3	4.5	-.8	4.0	5.4	1.4	4.7	6.6	1.9	4.87	5.52	.65
14	9.4	10.0	.6	9.0	10.7	1.7	8.0	9.8	1.8	8.4	9.5	1.1	8.3	9.5	1.2	8.7	10.2	1.5	8.63	9.95	1.32
15	6.4	7.6	1.2	7.4	7.7	.3	8.0	8.8	.8	7.4	9.1	1.7	7.3	8.2	.9	8.4	8.9	.5	7.48	8.38	.90
16	5.0	6.3	1.3	6.6	6.9	.3	3.6	4.6	1.0	7.9	6.7	-1.2	7.3	5.4	-1.9	5.7	4.8	-.9	6.02	5.78	-.23
17	7.4	7.0	-.4	7.7	8.1	.4	7.5	8.4	.9	5.3	5.6	.3	5.4	8.9	3.5	9.1	8.0	-1.1	7.07	7.67	.60
18	6.4	7.6	1.2	6.6	7.4	.8	6.4	7.6	1.2	4.8	7.5	2.7	5.4	6.6	1.2	5.9	5.9	0.0	5.92	7.10	1.18
19	7.1	7.8	.7	7.7	8.5	.8	5.5	8.8	3.3	6.1	7.8	1.7	7.8	7.1	-.7	6.1	6.9	.8	6.72	7.82	1.10
20	6.3	7.5	1.2	6.0	5.7	-.3	6.4	6.5	.1	6.1	7.5	1.4	7.6	7.1	-.5	6.5	6.6	.1	6.48	6.82	.33
21	5.2	6.4	1.2	5.8	7.4	1.6	3.8	4.6	.8	3.9	6.1	2.2	5.7	6.0	.3	5.9	5.4	-.5	5.05	5.98	.93
MEAN->	6.8	7.9	1.1	7.1	7.6	.5	6.4	7.3	.9	6.7	7.2	.6	6.8	7.4	.6	6.7	7.7	1.0	6.75	7.53	.77
S.D.->	1.1	1.2	.6	1.1	1.4	.7	1.4	1.6	1.0	1.2	1.4	1.2	1.3	1.2	1.3	1.2	1.4	1.1	.94	1.18	.56
Ex^2->	994	1335	33	1087	1245	15	905	1189	39	967	1142	38	1010	1184	42	976	1292	46	977	1219	19
Ex--->	143	166	23	149	159	10	135	154	19	140	152	12	143	156	12	141	162	21	142	158	16

Table 44 - Grade 8 Individual C.T.B.S. Treatment Group Results

Grade 8 Treatment Class C.T.B.S. Results

	Vocab			Read			Spell			Capit			Punct			Usage			All		
STUD #	V1	V2	VD	R1	R2	RD	S1	S2	SD	C1	C2	CD	P1	P2	PD	U1	U2	UD	A1	A2	AD
1	9.3	9.7	.4	9.5	10.4	.9	10.0	10.2	.2	9.7	10.2	.5	9.7	10.3	.6	8.9	10.4	1.5	9.52	10.20	.68
2	7.5	8.1	.6	4.4	8.3	3.9	8.7	8.5	-.2	6.4	8.4	2.0	7.5	8.5	1.0	8.2	7.8	-.4	7.12	8.27	1.15
3	8.2	8.2	0.0	7.7	8.5	.8	8.5	8.7	.2	9.1	9.7	.6	7.9	8.8	.9	8.7	7.2	-1.5	8.35	8.52	.17
4	8.4	9.2	.8	9.1	10.0	.9	9.1	10.6	1.5	9.1	9.1	0.0	8.8	9.3	.5	8.5	7.8	-.7	8.83	9.33	.50
5	7.0	8.0	1.0	8.2	8.6	.4	8.1	8.1	0.0	8.7	8.0	-.7	9.0	8.2	-.8	8.0	6.9	-1.1	8.17	7.97	-.20
6	7.0	6.6	-.4	6.1	6.6	.5	7.4	7.6	.2	9.1	7.4	-1.7	9.3	7.9	-1.4	8.9	9.7	.8	7.97	7.63	-.33
7	9.0	9.2	.2	9.5	10.0	.5	10.4	10.8	.4	10.7	11.3	.6	10.7	12.2	1.5	9.5	10.7	1.2	9.97	10.70	.73
8	4.9	6.0	1.1	7.0	5.0	-2.0	4.9	5.2	.3	7.1	5.8	-1.3	6.5	6.2	-.3	4.8	4.8	0.0	5.87	5.50	-.37
9	8.0	6.2	-1.8	5.7	6.1	.4	8.1	7.4	-.7	6.4	7.1	.7	6.2	6.5	.3	3.9	6.1	2.2	6.38	6.57	.18
10	10.6	11.4	.8	9.8	10.2	.4	11.1	8.9	-2.2	8.7	9.7	1.0	10.1	9.0	-1.1	10.0	9.2	-.8	10.05	9.73	-.32
11	8.0	7.7	-.3	7.6	7.3	-.3	6.5	6.8	.3	7.1	6.7	-.4	5.4	5.4	0.0	6.9	6.6	-.3	6.92	6.75	-.17
12	8.0	9.3	1.3	9.9	10.8	.9	11.3	11.9	.6	10.0	11.6	1.6	11.4	10.7	-.7	11.1	11.1	0.0	10.28	10.90	.62
13	9.5	10.3	.8	10.0	9.5	-.5	11.6	10.8	-.8	10.4	10.2	-.2	10.3	10.1	-.2	10.4	10.7	.3	10.37	10.27	-.10
14	9.5	11.0	1.5	10.2	9.7	-.5	10.4	11.1	.7	10.2	9.1	-1.1	9.0	11.0	2.0	11.1	9.5	-1.6	10.07	10.23	.17
15	7.4	8.4	1.0	8.8	8.6	-.2	9.3	10.0	.7	9.7	9.4	-.3	9.0	9.7	.7	8.0	8.9	.9	8.70	9.17	.47
16	8.1	8.6	.5	5.9	7.5	1.6	5.8	5.2	-.6	10.2	7.4	-2.8	9.7	9.1	-.6	8.9	8.5	-.4	8.10	7.72	-.38
17	9.2	9.5	.3	9.7	10.0	.3	10.8	10.6	-.2	8.4	11.3	2.9	9.5	10.7	1.2	10.0	10.1	.1	9.60	10.37	.77
18	9.3	8.5	-.8	9.4	9.9	.5	7.4	8.1	.7	9.4	8.4	-1.0	9.5	9.5	0.0	9.7	9.2	-.5	9.12	8.93	-.18
19	8.9	9.7	.8	8.3	9.9	1.6	9.3	8.7	-.6	10.0	10.7	.7	9.9	10.5	.6	10.0	10.0	0.0	9.40	9.92	.52
20	7.0	7.0	0.0	6.6	7.3	.7	7.4	7.4	0.0	6.7	7.4	.7	7.1	7.4	.3	5.8	4.8	-1.0	6.77	6.88	.12
21	7.4	5.7	-1.7	6.6	8.5	1.9	10.4	10.6	.2	8.4	8.7	.3	9.3	9.5	.2	7.5	8.7	1.2	8.27	8.62	.35
MEAN->	8.2	8.5	.3	8.1	8.7	.6	8.9	8.9	.0	8.8	8.9	.1	8.8	9.1	.2	8.5	8.5	-.0	8.56	8.77	.21
S.D.->	1.2	1.5	.9	1.7	1.5	1.1	1.8	1.9	.7	1.3	1.6	1.3	1.5	1.7	.8	1.9	1.8	1.0	1.32	1.49	.43
Ex^2->	1443	1564	18	1434	1639	33	1726	1741	11	1676	1729	34	1692	1786	16	1595	1591	20	1576	1662	5
Ex--->	172	178	6	170	183	13	186	187	1	186	188	2	186	190	5	179	179	-0	180	184	4

Table 45 - Grade 8 Individual C.T.B.S. Control Group Results

Grade 8 Control Class C.T.B.S. Results

	Vocab			Read			Spell			Capit			Punct			Usage			All		
STUD #	V1	V2	VD	R1	R2	RD	S1	S2	SD	C1	C2	CD	P1	P2	PD	U1	U2	UD	A1	A2	AD
1	9.0	9.2	.2	8.5	9.1	.6	8.7	10.0	1.3	10.0	10.4	.4	9.9	10.1	.2	10.0	9.2	-.8	9.35	9.67	.32
2	7.5	7.8	.3	7.2	6.1	-1.1	6.5	7.2	.7	7.7	7.4	-.3	7.7	6.5	-1.2	6.6	5.8	-.8	7.20	6.80	-.40
3	9.3	9.2	-.1	9.1	8.9	-.2	9.3	11.1	1.8	9.4	9.4	0.0	9.5	10.1	.6	9.5	10.4	.9	9.35	9.85	.50
4	7.0	7.5	.5	7.2	7.0	-.2	6.5	6.2	-.3	5.8	5.1	-.7	5.8	5.8	0.0	6.1	6.9	.8	6.40	6.42	.02
5	9.0	9.5	.5	9.2	9.5	.3	10.4	10.4	0.0	10.2	10.7	.5	9.3	9.9	.6	7.5	7.5	0.0	9.27	9.58	.32
6	9.0	8.6	-.4	10.4	9.8	-.6	11.6	11.3	-.3	9.4	10.0	.6	11.0	11.0	0.0	8.9	8.7	-.2	10.05	9.90	-.15
7	7.4	7.2	-.2	8.6	7.6	-1.0	7.6	8.5	.9	8.0	8.0	0.0	7.7	5.8	-1.9	7.8	8.5	.7	7.85	7.60	-.25
8	8.5	9.2	.7	8.6	8.1	-.5	10.0	9.3	-.7	9.1	10.0	.9	9.5	9.7	.2	10.0	9.7	-.3	9.28	9.33	.05
9	11.0	11.4	.4	10.2	10.8	.6	9.7	10.2	.5	10.0	9.7	-.3	9.0	10.3	1.3	8.9	9.7	.8	9.80	10.35	.55
10	8.8	8.9	.1	9.1	9.9	.8	9.7	8.7	-1.0	9.7	10.0	.3	10.1	10.1	0.0	9.7	9.5	-.2	9.52	9.52	0.00
11	8.3	8.2	-.1	9.2	8.9	-.3	10.0	10.2	.2	9.1	8.1	-1.0	9.5	9.7	.2	9.2	9.5	.3	9.22	9.10	-.12
12	6.8	8.0	1.2	8.2	8.4	.2	6.0	7.0	1.0	7.1	6.7	-.4	7.9	8.5	.6	8.2	7.2	-1.0	7.37	7.63	.27
13	8.4	8.3	-.1	8.4	8.5	.1	10.8	9.1	-1.7	8.7	8.7	0.0	9.3	9.5	.2	8.0	8.5	.5	8.93	8.77	-.17
14	8.8	9.3	.5	8.6	9.5	.9	9.7	9.7	0.0	6.7	6.7	0.0	7.1	6.8	-.3	7.8	8.7	.9	8.12	8.45	.33
15	6.4	6.8	.4	7.9	6.1	-1.8	8.5	8.1	-.4	7.1	6.7	-.4	7.7	6.5	-1.2	6.9	7.5	.6	7.42	6.95	-.47
16	9.7	10.6	.9	8.4	9.5	1.1	9.5	10.2	.7	7.7	9.4	1.7	8.8	9.0	.2	8.7	8.9	.2	8.80	9.60	.80
17	8.0	8.6	.6	8.9	8.9	0.0	9.3	8.5	-.8	7.7	9.1	1.4	9.7	9.7	0.0	9.2	8.9	-.3	8.80	8.95	.15
18	9.0	9.0	0.0	9.8	8.9	-.9	6.2	7.6	1.4	8.4	9.4	1.0	10.3	10.3	0.0	9.2	9.5	.3	8.82	9.12	.30
19	8.3	9.0	.7	8.1	8.4	.3	10.2	9.7	-.5	7.4	8.4	1.0	8.2	7.9	-.3	8.9	8.2	-.7	8.52	8.60	.08
20	8.6	8.5	-.1	8.4	9.1	.7	10.4	10.2	-.2	10.0	9.7	-.3	9.7	9.3	-.4	8.0	7.9	-.1	9.18	9.12	-.07
21	7.5	6.4	-1.1	7.7	7.0	-.7	8.7	9.3	.6	5.5	4.2	-1.3	9.0	7.7	-1.3	6.6	8.0	1.4	7.50	7.10	-.40
22	9.0	9.7	.7	9.9	10.6	.7	10.8	10.6	-.2	9.7	9.1	-.6	9.7	10.1	.4	8.9	8.7	-.2	9.67	9.80	.13
23	8.4	8.8	.4	8.2	8.1	-.1	9.7	8.9	-.8	9.1	7.4	-1.7	8.8	6.3	-2.5	8.9	10.1	1.2	8.85	8.27	-.58
MEAN-)	8.4	8.7	.3	8.7	8.6	-.0	9.1	9.2	.1	8.4	8.4	.0	8.9	8.7	-.2	8.4	8.6	.2	8.66	8.72	.05
S.D.-)	1.0	1.1	.5	.8	1.2	.7	1.5	1.3	.8	1.4	1.7	.8	1.2	1.6	.9	1.1	1.1	.7	.94	1.10	.34
Ex^2-)	1654	1762	7	1752	1751	12	1968	1994	17	1670	1705	16	1862	1811	18	1655	1723	11	1746	1775	3
Ex---)	194	200	6	200	199	-1	210	212	2	194	194	1	205	201	-5	194	198	4	199	200	1

Table 46 - Grade 9 Individual C.T.B.S. Treatment Group Results

Grade 9 Treatment Class C.T.B.S. Results

STUD #	RP1	RP2	RPD	WP1	WP2	WPD	A1	A2	AD
1	34	21	-13	57	50	-7	45.5	35.5	-10
2	51	61	10	47	37	-10	49	49	0
3	34	2	-32	10	13	3	22	7.5	-14.5
4	13	29	16	36	41	5	24.5	35	10.5
5	95	91	-4	99	98	-1	97	94.5	-2.5
6	27	29	2	13	24	11	20	26.5	6.5
7	97	99	2	98	94	-4	97.5	96.5	-1
8	76	69	-7	85	90	5	80.5	79.5	-1
9	51	57	6	77	54	-23	64	55.5	-8.5
10	79	76	-3	64	83	19	71.5	79.5	8
11	24	11	-13	8	34	26	16	22.5	6.5
12	57	51	-6	43	56	13	50	53.5	3.5
13	90	94	4	94	69	-25	92	81.5	-10.5
14	79	94	15	73	90	17	76	92	16
15	84	61	-23	94	85	-9	89	73	-16
16	21	6	-15	36	10	-26	28.5	8	-20.5
17	98	98	0	99	98	-1	98.5	98	-.5
18	79	79	0	66	73	7	72.5	76	3.5
19	82	85	3	74	60	-14	78	72.5	-5.5
20	79	83	4	93	37	-56	86	60	-26
21	90	72	-18	97	92	-5	93.5	82	-11.5
22	76	94	18	73	75	2	74.5	84.5	10
23	94	95	1	89	83	-6	91.5	89	-2.5
24	10	28	18	6	15	9	8	21.5	13.5
25	40	39	-1	19	19	0	29.5	29	-.5
MEAN->	62.4	60.96	-1.44	62	59.2	-2.8	62.2	60.08	-2.12
S.D.->	28.56	31.159	12.3517	31.702	28.960	16.833	29.397	28.677	10.453
Ex^2->	117748	117176	3866	121226	108584	7280	118326	110800	2844
Ex--->	1560	1524	-36	1550	1480	-70	1555	1502	-53

Table 47 - Grade 9 Individual C.T.B.S. Control Group Results

Grade 9 Control Class C.T.B.S. Results

1	63	51	-12	26	27	1	44.5	39	-5.5
2	27	16	-11	32	37	5	29.5	26.5	-3
3	44	41	-3	21	3	-18	32.5	22	-10.5
4	18	51	33	51	21	-30	34.5	36	1.5
5	92	85	-7	80	83	3	86	84	-2
6	3	24	21	32	54	22	17.5	39	21.5
7	92	91	-1	91	90	-1	91.5	90.5	-1
8	72	76	4	83	60	-23	77.5	68	-9.5
9	61	13	-48	57	85	28	59	49	-10
10	57	49	-8	66	75	9	61.5	62	.5
11	24	29	5	57	60	3	40.5	44.5	4
12	82	89	7	66	72	6	74	80.5	6.5
13	51	49	-2	70	75	5	60.5	62	1.5
14	31	21	-10	10	41	31	20.5	31	10.5
15	7	11	4	26	19	-7	16.5	15	-1.5
16	40	29	-11	57	21	-36	48.5	25	-23.5
17	63	45	-18	77	54	-23	70	49.5	-20.5
18	72	72	0	96	88	-8	84	80	-4
19	1	33	32	66	54	-12	33.5	43.5	10
20	99	99	0	99	99	0	99	99	0
21	94	95	1	99	90	-9	96.5	92.5	-4
22	34	79	45	93	72	-21	63.5	75.5	12
23	95	98	3	98	94	-4	96.5	96	-.5
MEAN->	53.13	54.173	1.04347	63.173	59.739	-3.434	58.152	56.956	-1.195
S.D.->	30.64	29.192	18.5460	27.215	27.354	16.833	26.391	25.671	9.7765
Ex^2->	86532	87102	7936	108827	99292	6789	93798	89771	2231
Ex--->	1222	1246	24	1453	1374	-79	1338	1310	-28

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Appendix A

Inservice for Treatment Group Teachers

Treatment group teachers were inserviced for two half days on the mechanical operation of MECC Writer. In addition, five of the six treatment group teachers had the computer consultant teach the first treatment class computer lab session. Biweekly treatment group teachers and computer consultant meetings as well as in class visits supplemented the scheduled inservice. Additional software that was introduced during the course of the study was addressed in the biweekly meetings and the class visits.

The following is an outline followed during the two scheduled inservice sessions.

Inservice for Treatment Group Teachers

November 25, 1985

Computers, I think we can safely say, are here to stay. It is more than just likely that the computer will become a part of everyone's education from kindergarten to post-secondary education. High-technology often brings on a fear of the unknown; a feeling of intimidation. We must always remember that in spite of what the science fiction writers tell us, computers are not able to think for themselves. They require a person to reason for them; to give them instructions. Economist Leo Cherne:

> "The computer is incredibly fast, accurate, and stupid. Man is unbelievably slow, inaccurate, and brilliant. The marriage of the two is a force beyond calculation."

Always remember that the computer is a machine. It has no innate intelligence. It is a tool for you to use, just as your car is a tool for you to use. Just as you need not know the internal workings of your car to be able to use it, you need not know the internal workings of your computer to make it work for you. You need only to know how to 'drive' your computer.

I. The parts of an APPLE IIe
  A keyboard
  B monitor
  C disk drives, disks, and files
  D printers
II. What is a program
  Word Processing-an overview
III. The MECC Writer
  A Introduction
  B Gateway
  C Formatting a DATA DISK

IV. The Word Processor

- A creating files from scratch from...starting a new file...The Fox and The Dog
  - 1 return key
  - 2 word wrap
  - 3 basic cursor movement (arrow keys)
  - 4 centre text
  - 5 insert
  - 6 delete key
- B saving a file
  - 1 [CTRL] S = (replaces old copy on disk)
  - 2 [CTRL] S new file name
- C loading an existing file
  - 1 [CTRL] N (new) clearing memory
    [CTRL] L file name
    - a) more cursor movement
      [CTRL] E end
      [CTRL] B beginning
    - b) deleting large blocks of text
      - i) [CTRL] W word
      - ii) [CTRL] X paragraph
    - c) moving text
      - i) [CTRL] W [CTRL] V word
      - ii) [CTRL] X [CTRL] Z paragraph
    - d) finding text [CTRL] F/text/
      - i) next occurrence (space bar)
      - ii) stop (s)
    - e) replacing text [CTRL] F/old text/new text/
      - i) replace (r)
      - ii) next occurrence (space bar)
      - iii) stop (s)
    - f) replace all occurrences [CTRL] F/old text/new text/a
  - 2 [CTRL] L without [CTRL] N merge files at cursor position
- D printing a file
  - a) .lm left margin
  - b) .rm right margin
  - c) .ff new page
  - d) \text\ underline
  - e) elite (12) pitch
    .lm6
    .rm88
  - f) [CTRL] P print
    single or double space

The importance of frequent saving of the file you are working on cannot be overemphasized. Use [CTRL] S = often when working with a file.

Just as it takes a lot of practice to feel comfortable behind the wheel of a car, it takes a lot of practice to feel comfortable behind the keyboard of a computer. Remember my phone number is 782-6601. Call me if you get stuck.

HAPPY WORD PROCESSING!

Appendix B - Software Used

The following pages are photocopies of MECC product description pages from The MECC Book, 1985-86, and 1986-87 Supplement to The MECC Book..

GHOST WRITER
No. A-156 (Apple)

Curriculum Area: Language Arts

Subject: Composition

Grade Level: 7-12

Topic: Writing Revision

Description: This package focuses student attention on the critical examination and revision stages of the writing process.

Computer Rationale: Students use the computer as a tool to examine, refine, and polish their own writings.

Features:
- checks text files created with any of the following word processing programs: MECC Writer, Apple Writer II for the //e, Bank Street Writer, Milliken's Writing Workshop, Magic Window II, or PIE Writer
- prints reports on paper or on the screen

Menu Options:

READABILITY TEST - Provides a grade-level estimate of reading difficulty.

SENTENCE LENGTH ANALYZER - Graphs the relative lengths of sentences and compares those lengths to national norms.

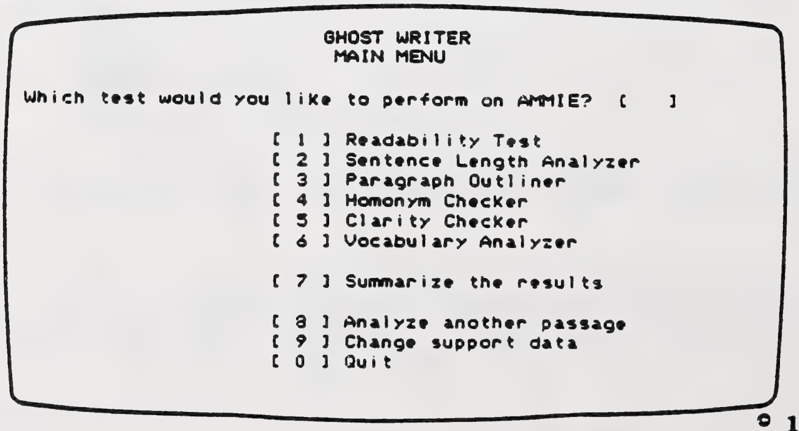
PARAGRAPH OUTLINER - Graphs the relative lengths of paragraphs and displays topic and summary sentences as well as transition words.

HOMONYM CHECKER - Identifies frequently used homonyms.

CLARITY CHECKER - Checks for several potentially troublesome writing elements, including prepositions, passive voice, and conjunctions.

VOCABULARY ANALYZER - Indicates the number of times that each word is used in a composition.

SUMMARIZE THE RESULTS - Combines and displays information on a composition from four of the previous programs.



```
                     GHOST WRITER
                      MAIN MENU

Which test would you like to perform on AMMIE?  [   ]

                  [ 1 ] Readability Test
                  [ 2 ] Sentence Length Analyzer
                  [ 3 ] Paragraph Outliner
                  [ 4 ] Homonym Checker
                  [ 5 ] Clarity Checker
                  [ 6 ] Vocabulary Analyzer

                  [ 7 ] Summarize the results

                  [ 8 ] Analyze another passage
                  [ 9 ] Change support data
                  [ 0 ] Quit
```

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In using Ghost Writer, students should be able to:

- proofread their compositions for selected punctuation and usage errors;
- examine their compositions for variety in sentence length and transitions between paragraphs;
- identify homonyms used incorrectly in their compositions;
- determine the number of times each word is used in their compositions;
- determine the approximate reading level of their compositions;
- analyze their compositions for basic writing elements, such as the use of prepositions, passive voice, and conjunctions.

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MECC EDITOR
No. A-135 (Apple)

Curriculum Area: Language Arts **Subject:** Composition

Grade Level: 7-12 **Topic:** Writing Revision

Description: This package of five programs focuses student attention on the revision stage of the writing process.

Computer Rationale: Learners use the computer as a tool to refine and polish their prose.

Features:
- provides on-screen editing capability
- prints reports on paper or on the screen
- checks text files created with either MECC Writer or Apple Writer II word processing programs

Menu Options:

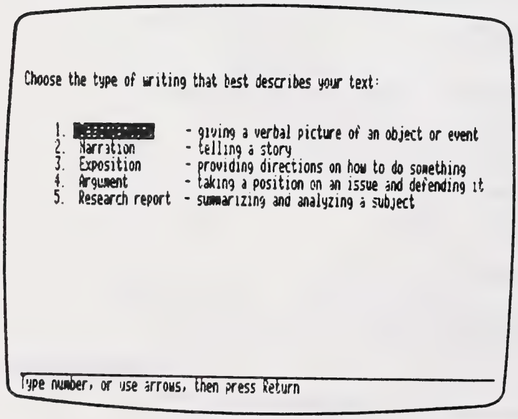
OUTLINE IDEAS - Guides students in constructing an outline of the main ideas and supporting details evident in their writing samples.

REVIEW QUALITIES - Helps students check their writing for the presence of certain rhetorical qualities or key traits specific to a particular type of writing.

ANALYZE PROSE - Offers suggestions on style, usage, and mechanics as well as provides the opportunity to edit text immediately.

PICTURE PARAGRAPHS - Graphs relative lengths of sentences and paragraphs and prints sentences separately so that students can check their use of transitions and their placement of topic and summary sentences.

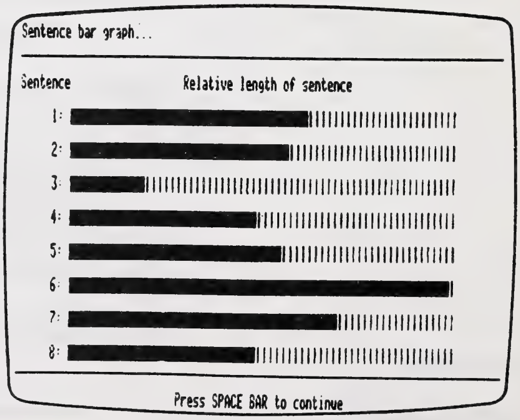
PRINT REPORTS - Allows students to print reports generated by the first two programs.



```
Choose the type of writing that best describes your text:

    1. [illegible]       - giving a verbal picture of an object or event
    2. Narration         - telling a story
    3. Exposition        - providing directions on how to do something
    4. Argument          - taking a position on an issue and defending it
    5. Research report   - summarizing and analyzing a subject

Type number, or use arrows, then press Return
```



```
Sentence bar graph...

Sentence          Relative length of sentence
   1:
   2:
   3:
   4:
   5:
   6:
   7:
   8:

              Press SPACE BAR to continue
```

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After using OUTLINE IDEAS, the student should be able to:

- recognize main ideas and supporting details;
- visualize idea development in a composition.

After using REVIEW QUALITIES, the student should be able to:

- recognize five types of writing typically required in a classroom setting;
- identify in their own writing the rhetorical qualities or primary traits specific to one of those types;
- revise their writing according to predefined criteria.

After using ANALYZE PROSE, the student should be able to:

- revise their text in specific areas of style and usage;
- proofread their text for selected punctuation and capitalization errors.

After using PICTURE PARAGRAPHS, the student should be able to:

- understand the need for sentence variety, transitions between paragraphs, and sentence-combining strategies.

After using PRINT REPORTS, the student should be able to:

- compare program-generated reports to original drafts of compositions.

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MECC KEYBOARDING MASTER
No. A-131 (Apple)

Curriculum Area: Computer Literacy **Subject**: Computing and Information

Grade Level: 4-9 **Topic**: Keyboarding Techniques

Description: These activities in game and drill format are designed to help students polish their touch-typing skills. Teachers can create drill lessons of their own and monitor student progress. (This package was developed by the TIES organization of Minnesota.)

Computer Rationale: Students of today and the future will be working extensively with computers (for example, through word processing, CAI, and programming). Learning correct typing habits can help students become more effective and efficient in their use of the computer.

Features:
- drills that pace students to improve their speed
- teacher utilities to track student scores and create personalized lessons

Menu Options:

KEYBOARD RACER - A typing game in which students improve their typing speed by racing against their own best time.

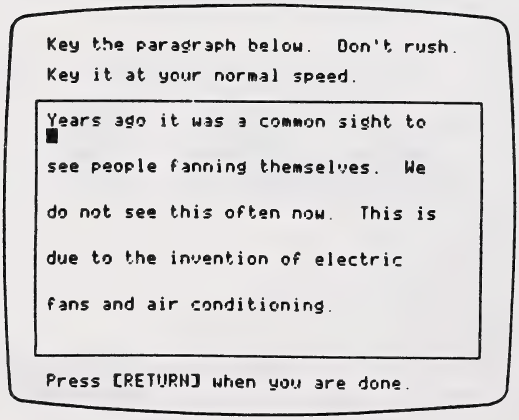
BALLOON POP - Students try to type a paragraph without errors as Guido the Balloonman inflates a balloon on the screen.

SENTENCE DRILL - Students type sentences first for speed and then for accuracy.

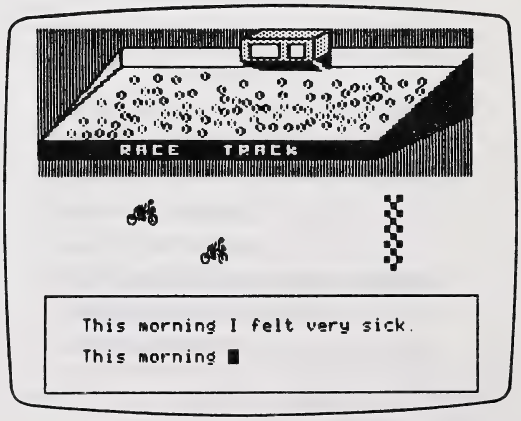
PARAGRAPH DRILL - Students type paragraphs for speed and accuracy.

KEY YOUR OWN LESSON - Students type up to four screens of material of their choosing and the computer checks their speed.

KEY A LESSON YOUR TEACHER MADE - Students choose from one to eighteen lessons created by the teacher.



```
Key the paragraph below.  Don't rush.
Key it at your normal speed.

Years ago it was a common sight to
■
see people fanning themselves.  We

do not see this often now.  This is

due to the invention of electric

fans and air conditioning.

Press [RETURN] when you are done.
```



```
This morning I felt very sick.
This morning ■
```

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After using MECC Keyboarding Master, the student should be able to:

- type a minimum of twenty gross words per minute (gwpm);
- reduce errors to no more than three uncorrected errors per minute;
- proofread personal typing for errors.

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MECC KEYBOARDING PRIMER
No. A-130 (Apple)

Curriculum Area: Computer Literacy **Subject**: Computing and Information

Grade Level: 4-6 **Topic**: Keyboarding Techniques

Description: MECC Keyboarding Primer enables students to learn correct techniques for typing. The package includes a student tutorial diskette containing eighteen lessons and a utilities diskette that enables the teacher to manage records on the student diskette. (This package was developed by the TIES organization of Minnesota.)

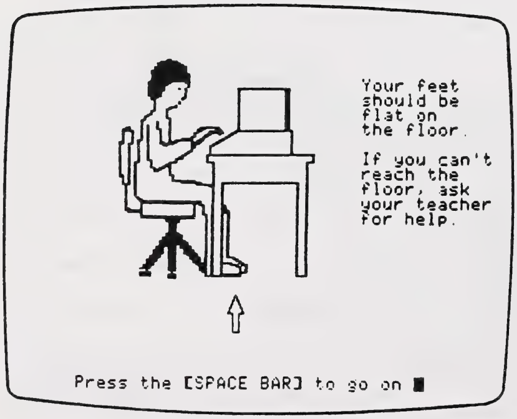
Computer Rationale: The computer permits practice at the keyboard with immediate feedback, an effective way to teach typing skills.

Features:
- an introductory section that familiarizes students with the keyboard, correct hand positioning, and instructions for using the tutorial
- visual representation of hand movement on the keyboard
- a management system that allows teachers to view and print student records

Menu Options:

INTRODUCTION - Introduces students to correct hand and body position and to the "home row," Space Bar, and Return, Escape, Left-Arrow, and Right-Arrow Keys.

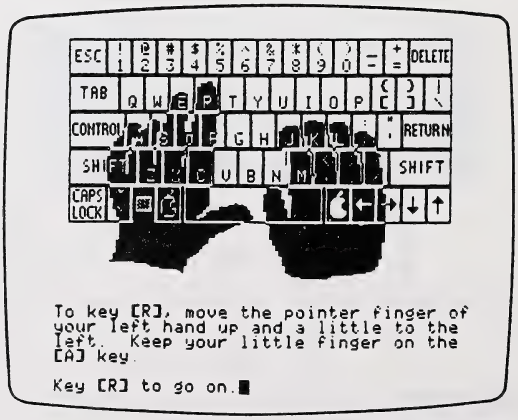
LESSONS - Eighteen lessons provide instruction and practice in using the keyboard, from the home row through number, punctuation, and other keys. Typing speed is reported after each practice and a report of the student's progress, which can be printed, is displayed at the end of each lesson.



Your feet should be flat on the floor.

If you can't reach the floor, ask your teacher for help.

Press the [SPACE BAR] to go on ■



To key [R], move the pointer finger of your left hand up and a little to the left. Keep your little finger on the [A] key.

Key [R] to go on.■

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After using MECC Keyboarding Primer, the student should be able to:

- understand the best techniques for using the keyboard, including hand and body positioning and fingering;
- find the various keys on the keyboard quickly;
- gain greater confidence in using the keyboard;
- improve his or her typing speed.

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MECC SPELLER
No. A-134 (Apple)

Curriculum Area: Language Arts

Subject: Writing

Grade Level: 6-10

Topic: Proofreading

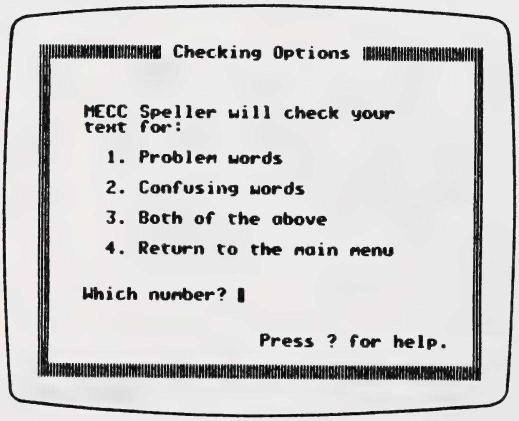
Description: MECC Speller is designed to help junior high students correct spelling and selected usage errors in their writing. MECC Speller is also designed with the classroom teacher in mind. The Management Options allow teachers to modify the dictionary to meet students' spelling needs. The package consists of the MECC Speller Program and Dictionary diskette(s) and an accompanying support manual.

Computer Rationale: MECC Speller extends the word processing approach to writing by providing an effective and efficient tool to help students proofread their text for spelling errors.

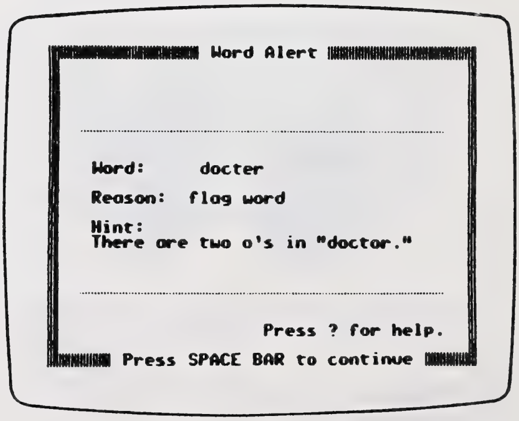
Features:
- students can check for misspelled words and the proper usage of selected homonyms and homographs
- MECC Speller reports can be printed out or viewed on the screen
- Management Options allow teachers to extend the dictionary and to create a glossary of flag words

Menu Options:

MECC SPELLER - An easy-to-use spelling checker compatible with MECC Writer and Apple Writer II. It has a dictionary of over 10,000 words that can be modified by using the Management Options. Students select to have their text checked for "problem words," "confusing words," or both. Students then decide whether they want to see their report on the screen or printed out.



```
Checking Options

MECC Speller will check your
text for:

  1. Problem words

  2. Confusing words

  3. Both of the above

  4. Return to the main menu

Which number?

                Press ? for help.
```



```
Word Alert

Word:     docter

Reason:  flag word

Hint:
There are two o's in "doctor."

                Press ? for help.
Press SPACE BAR to continue
```

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After using MECC Speller, the student should be able to:

- identify misspelled words, homonyms, and homographs used incorrectly in their text files;
- recognize the need for thorough proofreading of their writing.

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MECC WRITER
No. A-132 (Apple)

Curriculum Area: Language Arts **Subject**: Writing

Grade Level: Middle School-Adult **Topic**: Word Processing

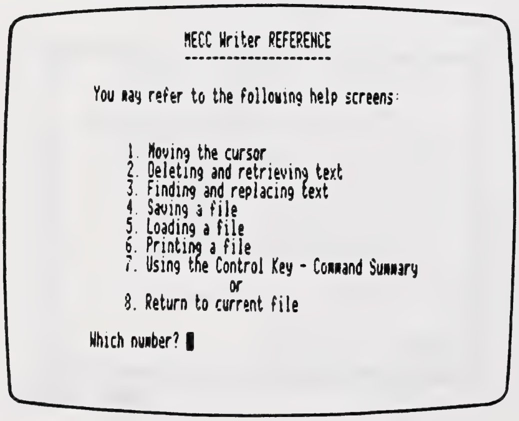
Description: MECC Writer is a simple word processing package for students at the middle school level and above. It is easy to learn and easy to use. Students use the same screen to compose, edit, and print text. The word processing capabilities of MECC Writer are also embedded into selected MECC products. These capabilities allow students to write sentences and paragraphs while using a MECC courseware product. Thus students need to learn only one word processing system.

Computer Rationale: A word processor enables students to compose and revise easily. Text can be saved on a data diskette, edited, and printed at any time.

Features:
- the program allows you to:
  - insert and delete letters, words, or paragraphs
  - move words and paragraphs
  - format text so that the screen layout agrees with the printed form or use embedded commands to adjust margins
  - underline text
  - find and replace text
- the accompanying manual contains two tutorials to aid learning

Menu Options:

MECC WRITER - An easy-to-use word processing program for composing, editing, and printing text. Students can view reference screens at any time by pressing Control-R. A data diskette is required to store files.

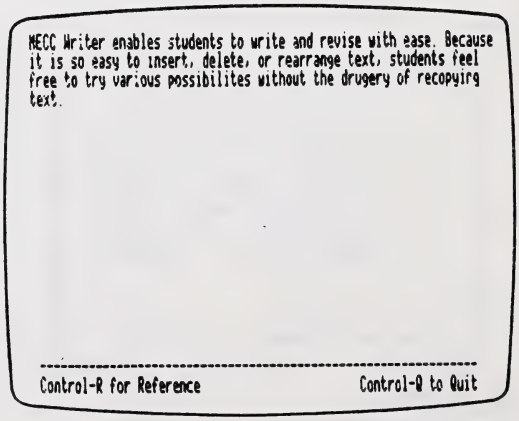


```
           MECC Writer REFERENCE
           ---------------------

 You may refer to the following help screens:


      1. Moving the cursor
      2. Deleting and retrieving text
      3. Finding and replacing text
      4. Saving a file
      5. Loading a file
      6. Printing a file
      7. Using the Control Key - Command Summary
                   or
      8. Return to current file

 Which number? █
```



```
MECC Writer enables students to write and revise with ease. Because
it is so easy to insert, delete, or rearrange text, students feel
free to try various possibilites without the drugery of recopying
text.





----------------------------------------------------------------
Control-R for Reference                        Control-Q to Quit
```

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After using MECC Writer, the student should be able to:

- understand the basic capabilities of a word processing system;
- use word processing to compose, edit, and print text.

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Curriculum Area: Language Arts **Subject:** Composition

Grade Level: 4-6 **Topic:** The Writing Process

Description: View and Write is a videotape designed to provide students with models for becoming familiar with the writing process, including prewriting, drafting, and editing. Students observe the value of revising their compositions and of working together in a cooperative, non-competitive manner, helping each other through peer-conferencing. The videotape also demonstrates the use of a word processor in various stages of composition.

Videotape Rationale: Television vignettes in mime or dialogue provide models and invite students to watch, discuss, and react in writing. The videotape provides a highly motivating atmosphere for developing good writing techniques.

Features:
- available in both VHS and Beta formats
- the accompanying support manual includes suggestions for the teacher, proposed lesson plans and student activities, and masters for transparencies and student handouts

A diskette does not accompany this videotape and manual.

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After using View and Write, the student should be able to:

- recognize that revision can improve writing quality;
- understand that revision is based on self-assessment, which requires making inferences about intentions and finding disparities between intention and text;
- understand that cooperative peer-conferencing can foster revision and subsequent improvement in writing quality;
- understand that the peer partner needs to provide specific descriptive feedback rather than vague judgments;
- understand that the peer partner can function as a potential audience/reader who can cite comprehension problems in drafts.

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Appendix C

Focused Interview Questions

Towards the end of May I intend to have a short interview with each of you. I will be asking questions about your experiences as a teacher, and your perceptions of your student's experiences with respect to the word processing project. I'm telling you this now so that you may give some thought to the following.

1. Do you feel that your student's writing improved (both quality and quantity) as a result of their use of word processing? If yes, in what ways? If no, did it suffer? How?

2. Did your students revise more? If yes, were the revisions of a minor nature only (spelling, grammar, punctuation), or did the revisions involve more elaborate rearranging of ideas, insertion of new ideas, and deletion of ideas?

3. If some students gained more from the word processing experience than others, why was this so? Was the reason academic ability, attitude towards school, home situation, or some other reason?

4. Do you perceive the use of word processing in Language Arts as a valuable activity? Why?

5. Does word processing improve writing, or is it simply a utility that makes it easier for the good writers to write?

6. Having had the experiences you have now had, how would you approach the introduction of word processing with your students if you were to do it again? Assume the ideal situation. ie.: You could have access to a lab when ever you wanted, computers in your classroom if you like, or even have one in each student's home.

7. What obstacles currently face a teacher wishing to integrate word processing into their classes?

8. Does the use of word processing for writing require introducing the writing process in a different manner than if word processors were not used? How?

9. Should the Language Arts curriculum at your grade level be changed to encourage the use of word processing? How would this be accomplished?

10. Is word processing a skill that all students should have? At what grade level would you introduce word processing?

11. Should keyboarding be included in the curriculum? At what grade level? What would go to make room?

12. Is introducing word processing without some formal training in keyboarding a mistake?

13. Based on your experiences, if you were to inservice teachers on the introduction of word processing in Language Arts what topics would your inservice session include?

14. Do you, as a result of your project experiences, use a word processor regularly for your own writing? Is word processing a skill that every teacher should have?

15. Describe the kinds of teaching strategies that worked well for you when integrating word processing into your classes.

16. Describe the kinds of teaching strategies that did not work well for you when integrating word processing into your classes.

17. How can the school board encourage the use of computers and word processing in county schools?

18. Would you like to, or do you intend to include word processing in your Language Arts program next year?

N.L.C. - B.N.C.
3 3286 07389450 9